Pacific Marine Review

The National Magazine of Shipping

JANUARY TWENTIETH ANNIVERSARY 1924

Official Organ
PACIFIC AMERICAN STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION OF THE PACIFIC COAST

Pacific Marine Review, Vol. 21, No. 1. Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. $2.00 a year.

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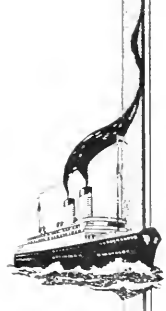
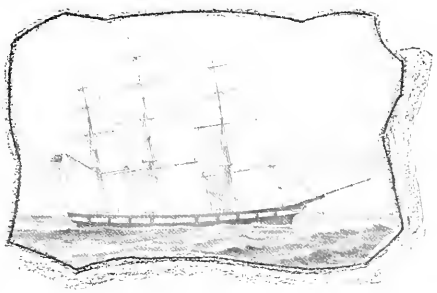


UNITED STATES INTERCOASTAL SERVICES

A Brief Account of the Development of Marine Traffic Between the Pacific Coast and the Atlantic Seaboard of the United States

THE marine service between the two sea coasts of the United States really began in 1848 and the start was in large measure contemporaneous with and due to the discovery of gold in California and to the taking of California by Americans.

Prior to that time there had been occasional sailing ships trading with the Spanish Americas and the Russians and supplying the Oregon fur trading stations. With the exception of vessels especially outfitted and laden by the fur companies for the servicing of their own enterprises in the Northwest, these early sailing vessels would carry outbound general merchandise for trading with the ports of the west coasts of South and Central America and of Mexico, and would buy up hides and tallow, returning home by way of China or the South Pacific and Cape of Good Hope. Often they would be out two or three years, trading back and forth in beach-la-mer between Polynesia and Manila.

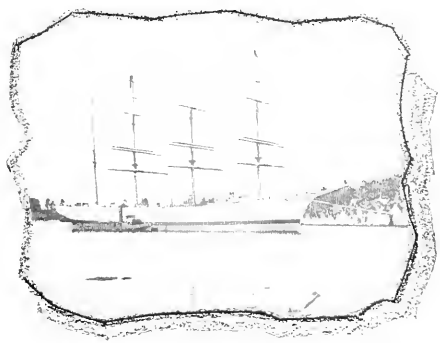


Ship Governor Clinton, homeward bound on the Pacific 13th of August, 1826.

A good example of these New England ships was the Governor Clinton, whose picture adorns this page. Of 383 tons burthen and a good fast sailer, this vessel was built in 1823 for N. L. and G. Griswold of New York. On April 15, 1825, with Captain D. Hepburn in charge and Captain Coggeshall as supercargo, she left New York on a trading voyage to the west coast of South America. Her cargo of general merchandise was invoiced at $100,000. After calling at ports in Chile, Peru, and Colombia she made for home by way of Cape Town and Gibraltar and arrived New York January 31, 1827.

This voyage is typical of the great majority of the trading ventures on the Cape Horn route. The vessels were managed by the masters and the supercargo, and were diverted to the ports and the trades which in the judgment of those officers would prove most profitable.

> "And where the sunrise reddened
> Old Tasman's creeping sail,
> Now whirls her great propeller,
> The huge Pacific Mail.
> Aye, where their fearful helmsman
> First trimmed his lonely light,
> Ablaze, the cargo steamer
> Churns onward through the night."



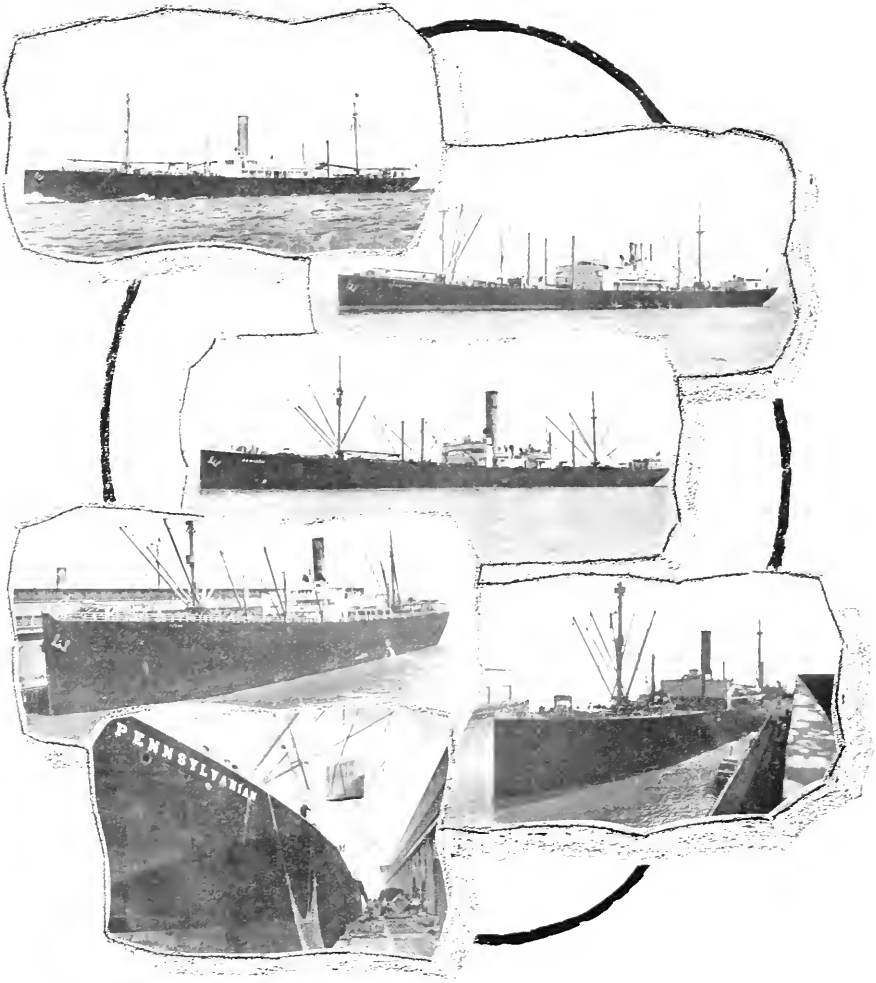
Ship Roanoke, 3400 tons register, as she appeared in the grain trade in 1893. The Roanoke was at that time the largest American sailing ship afloat

Regular Intercoastal Lines

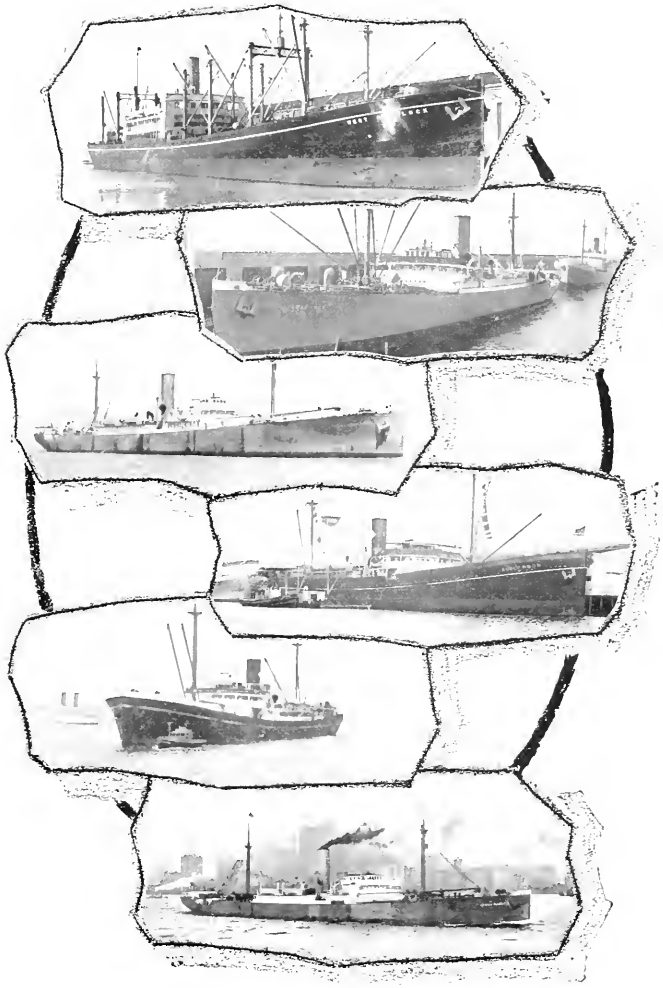
Late in the forties Congress began an investigation of routes for mail and freight service to the frontier posts along the Columbia River, and in 1845 the "Postal Department advertised for proposals to carry the mails from New York to Oregon via Panama." Specifications called for a semi-monthly service between New York and Panama and a monthly service between Panama and Columbia River ports. Tenders of $300,000, $199,000 and $151,000 a year were made and the contract was awarded to the lowest bidder. However, neither he nor any of the others could show financial responsibility and this first attempt fell by the wayside.

In the meantime Congress had passed an act authorizing this mail route and on April 12, 1848, W. H. Aspinwall, associated with Gardiner Howland and Henry Chauncey, incorporated the Pacific Mail Steamship Company for $500,000 and took up this mail contract. The act of Congress was subsequently amended to include call at San Francisco and carried a mail subvention of $200,000 per annum. The vessels were to be steamers of 1000 tons register and sidewheelers; were to be commanded by captains selected from the United States Navy; and were to be subject to government use in time of war.

Three steamers, the California, the Oregon and the Panama, were built expressly for this trade. All of them made the trip around the Horn via the

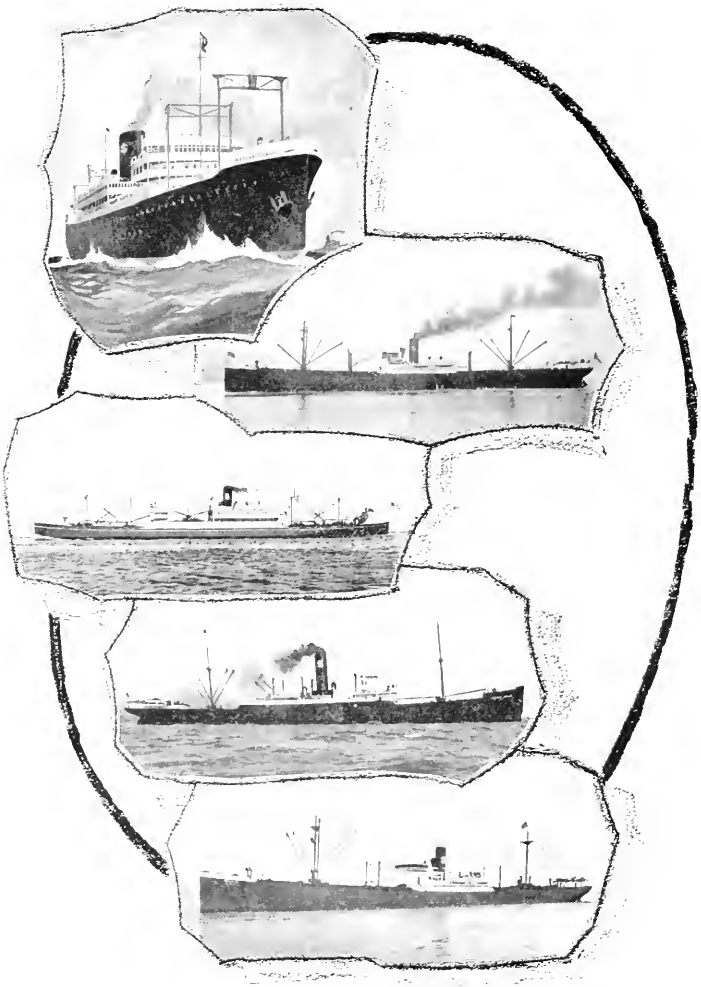


AMERICAN-HAWAIIAN STEAMSHIP COMPANY.
This group shows the freighters Iowan, Missourian, Mexican, Texan, Ohioan and Pennsylvanian.

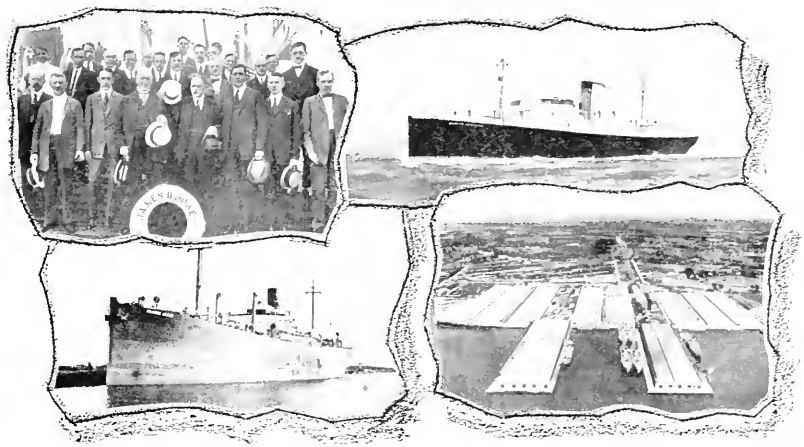


ARGONAUT STEAMSHIP LINE.
The steamer West Greylock.

ISTHMIAN STEAMSHIP LINES.
The steamers Steel Seafarer, Mobile City, Steel Inventor, Robin Hood, Robin Goodfellow and Steel Ranger.



DOLLAR STEAMSHIP LINE.
Steamers President Monroe and President Harrison, two of the seven 522-foot combination liners moving intercoastal in course of their Round-the-World Service; also this group shows the freighters Diana Dollar, Stanley Dollar and Stuart Dollar.

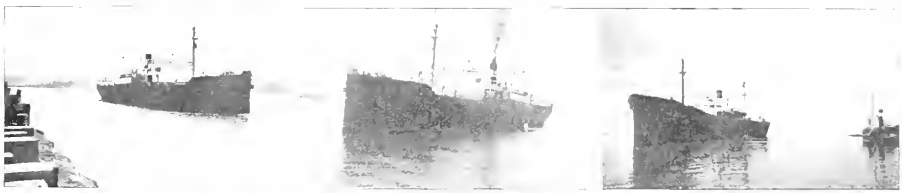


GARLAND LINE.

Showing the steamers Albert Jeffress and George Allen, and a view of the Garland Steamship Corporation terminal at Norfolk taken prior to the firm's entry into the intercoastal service. The group is of Garland officials aboard the steamer James B. Duke. First row, right to left—W. W. Cheek, T. M. Anderson, R. C. Harrison, G. G. Allen, James B. Duke, W. M. Champion, Thomas Fitzgerald (master), William Bell. Second row, right to left—Alexander H. Sands, Jr., George Sanders, H. P. Strause, J. H. Ruffin, J. P. Watson, H. W. Thompson, W. C. Steiger, E. F. Lawrence, W. R. Perkins, Forest Hyde, C. F. Haight, E. S. Bowling, Frank Lloyd, A. D. Kingsley, George Cooper.

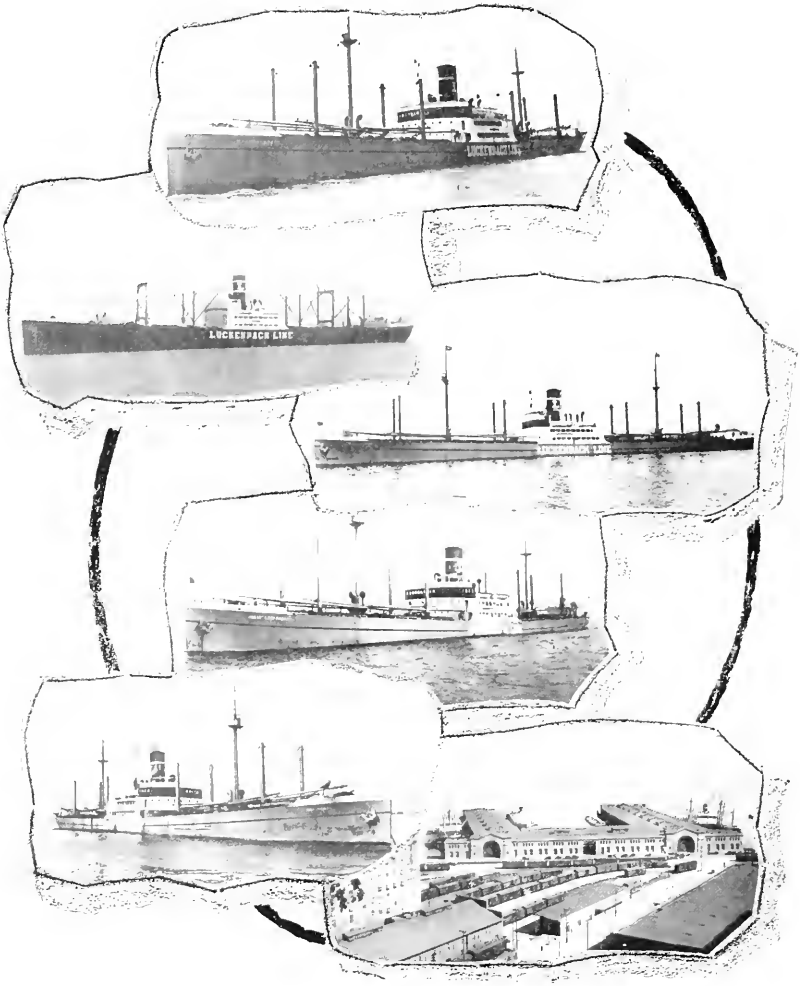
Straits of Magellan, the California first arriving February 28, 1849. The gold discovery had started, and many fine sailing ships were speeding round the Horn, marking the beginning of a contest between sail and steam that continued through many years, as is shown in the following table giving annual arrivals:

	Steamers				Sailers	
Year	Nicaragua Route		Panama Route			
	No.	Tons	No.	Tons	No.	Tons
1849	. .	. ....	14	13,581	233	200,000
1850	....	. ....	41	30,045	250	220,000
1851	6	6,006	66	56,037	275	240,000
1852	21	19,180	49	51,081	300	250,000
1853	25	28,906	45	54,526	344	260,045
1854	23	27,705	33	51,257	200	212,543
1855	24	29,941	23	44,631	150	155,000
1856	16	20,189	27	51,583	128	149,370
1857	2	2,491	24	46,200	90	109,525
1858	.		28	54,565	104	114,321
1859	.	.	40	70,643	141	157,076
1860	....	.... ..	39	68,030	115	129,950
1861	..	.	37	60,564	106	121,342
1862			39	74,680	110	119,936
1863	5	6,860	39	84,874	102	114,963
1864	5	8,176	42	106,180	116	120,064
1865	11	16,904	30	90,683	80	85,797
1866	12	17,893	37	106,939	83	90,176
1867	17	25,977	37	104,445	125	141,863
1868	4	5,416	62	168,747	123	135,763
1869	.	. ....	36	117,403	146	160,924
1870		.	25	78,124	75	84,137
1871			24	75,939	58	68,176
1872			28	76,897	84	96,739
1873			30	78,558	70	87,333
1874		.	45	109,213	65	88,688
1875	.	.	39	102,948	81	116,203
1876			25	68,558	88	128,333
1877			27	70,057	81	130,457
1878			27	64,291	64	99,424
1879			31	71,052	51	81,527
1880			28	66,697	57	92,552
1881			25	61,537	60	94,866
1882			27	72,097	73	117,341
1883	.		23	41,792	57	99,389
1884			26	44,073	55	89,947
1885			23	38,806	40	67,162
1886			38	62,280	29	52,521
Totals	171	215,643	1279	2,691,413	4409	4,903,445

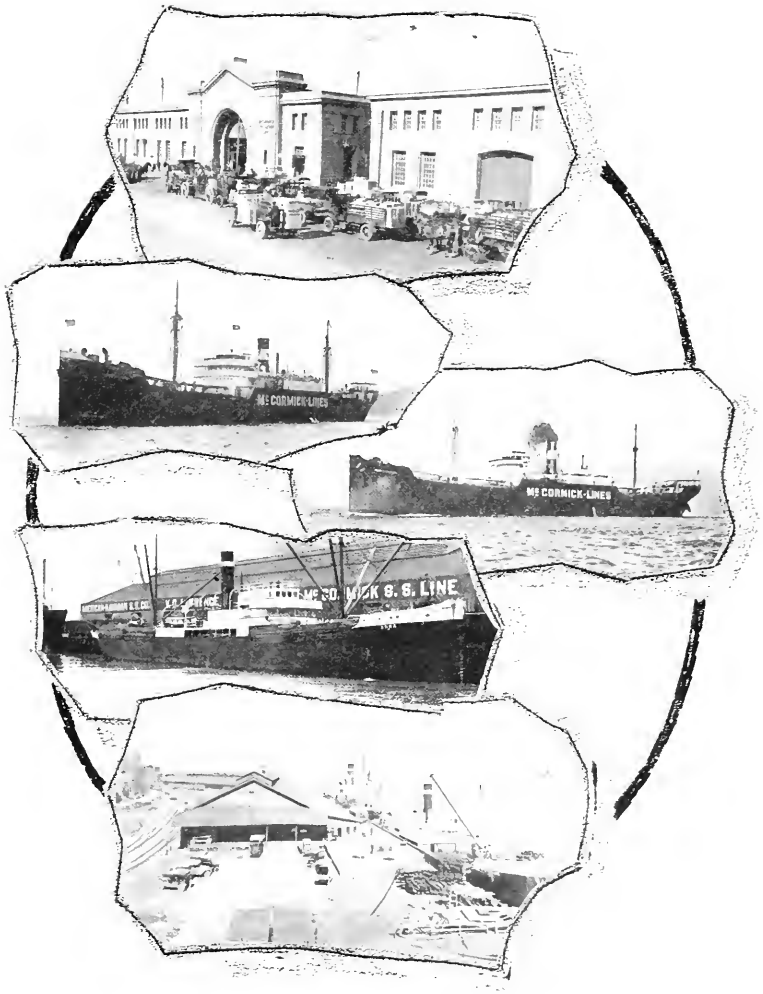


NASCO LINE.

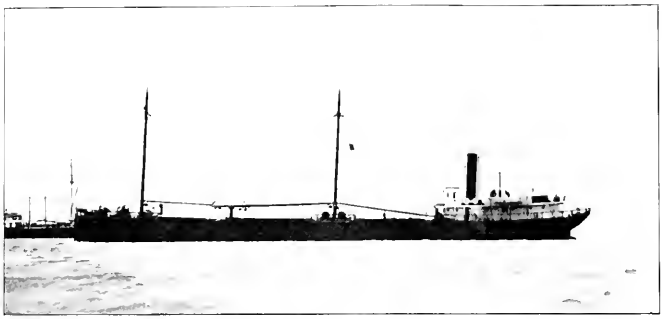
North Atlantic & Western Steamship Company is in the coastwise cast business with the steamers Artigas, Wabash, Lehigh, C. H. Harvey and Blue Triangle. The Robert Dollar Company are Pacific Coast agents.



LUCKENBACH LINE.
Here are the steamers K. I. Luckenbach, Dorothy Luckenbach, Edward Luckenbach, Julia Luckenbach and F. J. Luckenbach. Below are the Luckenbach piers at San Francisco.



MUNSON - McCORMICK LINE.
Embarcadero scene at San Francisco and the steamers Charles R. McCormick, Sidney M. Hauptman and the Edna. In the lower view are McCormick ships loading lumber at Tacoma.



PACIFIC-CARIBBEAN-GULF LINE

Operating with the steamers Eldorado, Alvarado and Ormidale between Pacific Coast ports and United States and Mexican gulf ports.

It is very interesting to note various factors in this trade at its beginning, for comparison with present conditions.

In 1850 cabin fare from New York to San Francisco was $450, not including transit across the Isthmus. In 1886 cabin fare to New York from San Francisco was $80. The largest passenger list up to 1852 was 600 on the Tennessee, December 2, 1851. On one trip in 1852 the Golden Gate, then the largest steamer in trade, carried 1052; and in 1856 a list of 1251 passengers was reported for this boat. The passage time from Panama to San Francisco varied from eleven to thirty days.

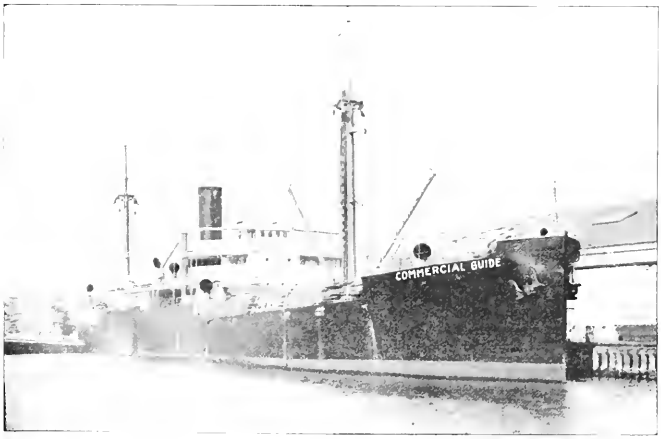
Rival Lines

By the end of 1852 the Pacific Mail Steamship Company had fourteen steamers on the Panama route and at least three lines were in operation. In 1851 Vanderbilt had started a line by the Nicaragua route with San Juan as the Pacific terminus. This line in 1852 had four steamers in operation and there were in addition the New Line with two steamers and the Empire City Line with one steamer. From 1852 on there was a constant succession of short-lived competing steamship companies with the Pacific Mail steadily leading.

In the early sixties the vessels on the Panama route were said to be "the largest and finest afloat on any ocean." Those were the Colorado, 3728 tons, the Constitution, 3575 tons, and the Gold City, 3593 tons. The first to arrive at San Francisco was the Constitution, October 5, 1862. The Colorado, last of the three, arrived July 1, 1865. These three steamers, with the Sacramento, 2647 tons, were ordered before the civil war by the Pacific Mail Steamship Company and were finished during the war.

Just after the war the Pacific Mail ordered five side-wheelers of from 3800 to 4500 tons at a cost of about a million and a quarter dollars each. These, said to be the most expensive vessels built up to that time, were primarily intended for the China run, but were frequently used in the Panama run.

In the seventies wooden construction and side-wheelers were both definitely abandoned by the Pacific Mail Steamship Company. The first iron-screw propeller in the trade was the Colima, of 3836 tons, which arrived at San Francisco in 1874.



MOORE & McCORMACK LINE.

Operating the steamers Commercial Guide, Commercial Pathfinder, Commercial Spirit and Commercial Traveler in the intercoastal trade

Another record going to the intercoastal trade was the first practical installation of electric light on shipboard. This was on the Colombia in 1880 and was also the first commercial installation of the Edison constant voltage system with the then new Edison carbon filament incandescent lamps.

Pacific Ports

San Francisco was the port on the Pacific side in the good old days and that her citizens and press were animated then by the same sort of enthusiasm which now enlivens her vigorous rivals is evidenced by the following from the Daily Alta California of November 6, 1850:

"China and the Sandwich Islands are yet to be reached from our shores by the agency of steam navigation, for just as sure as the territory of the United States reaches from the Atlantic to the Pacific, so sure will its steam commerce reach over the broad Pacific, and innumerable paddle wheels beat the reveille of commerce as it issues from the Golden Gate on its steaming way to the Celestial Empire."

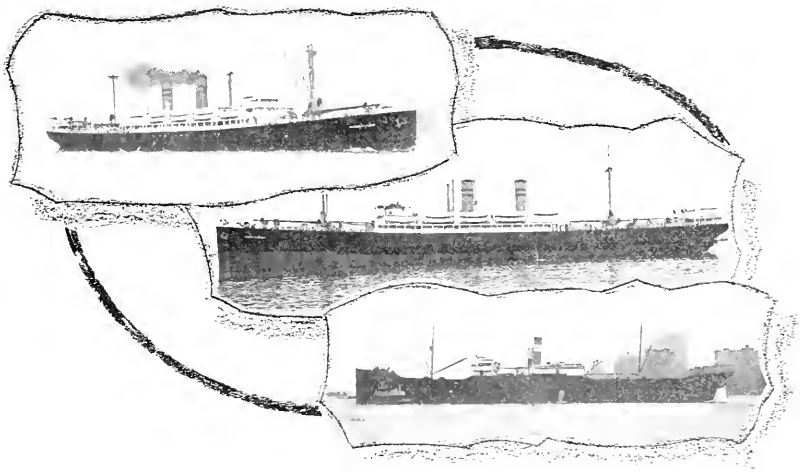
ance Company. This enables him to insure goods shipped abroad.—From W. A. Mathews."

Today Los Angeles is furnishing more cargo tonnage to the intercoastal trade than any port in America.

First Direct Steamer Service

About 1890 the late George W. Dickie, then manager of the Union Iron Works, San Francisco, read a paper before the Technical Society of the Pacific Coast and before he Mechanics Institute, proposing a regular line of coal-burning freighters from San Francisco to New York via the Straits of Magellan. This proposal caused much discussion. It included a scheme for financing, by popular subscription, the steamers to be built in San Francisco and the builders to take a large share in the ownership.

Later in the nineties Williams, Dimond & Company, who had long operated sailing vessels in the intercoastal trade, took up the matter and formed the present American-Hawaiian Steamship Company, ordering two freighters, the American and the Californian, the former to be built on the Atlantic and the latter at



UNITED AMERICAN LINES
Here we have the steamers Mount Clinton, Mount Carroll and the Peter Kerr.

San Francisco had a phenomenal growth in those early days and was served by good ships from every nation under the sun. Portland, Tacoma and Seattle soon assumed large proportions in the coastwise and foreign trade, and as we shall see later when the present phase of intercoastal trade opened up, these ports were ready to furnish large tonnage of cargoes to intercoastal steamers via the Panama Canal.

The port whose growth in this trade has been most phenomenal was never mentioned as a port in the early days. Occasionally sailing vessels, and more regularly coasting steamers, would touch at San Pedro, but of Los Angeles as a port no record appears. In the Los Angeles Express for August 30, 1873, we note the following item:

" . . . the efficient clerk at the depot, has been appointed agent of the Fireman's Fund Marine Insur-

San Francisco. By August, 1901, four fine steamers were on the run, making Honolulu a port of call, and four more were on the stocks in American shipyards. The time on this route averaged very closely around sixty days.

In 1903 oil burners were fitted to the boilers of the Nebraskan and proved such a success that the entire American-Hawaiian fleet was speedily converted.

In 1907 the Tehuantepec railway was opened across Mexico and the majority of the American-Hawaiian steamers were changed to this route, eliminating Honolulu. This route made possible a delivery through to New York in thirty days.

The number and size of vessels in this fleet increased, until on January 1, 1915, there were twenty-six steamers aggregating 254,000 tons deadweight ca-

A busy scene on the waterfront of the Los Angeles Shipbuilding & Drydock Corporation, Los Angeles Harbor.

pacity. Eight of these steamers were of 12,000 tons each.

Thus in sixty-five years the time had been cut in half as compared with steamer service via Panama, and divided by four as compared with sailing ships around the Horn.

Panama Canal

At the opening of the "Great Ditch" across the Isthmus there was a wonderful flurry in the intercoastal steamship business, almost immediately suppressed by the advent of the World War and the absorption of world shipping in the war game.

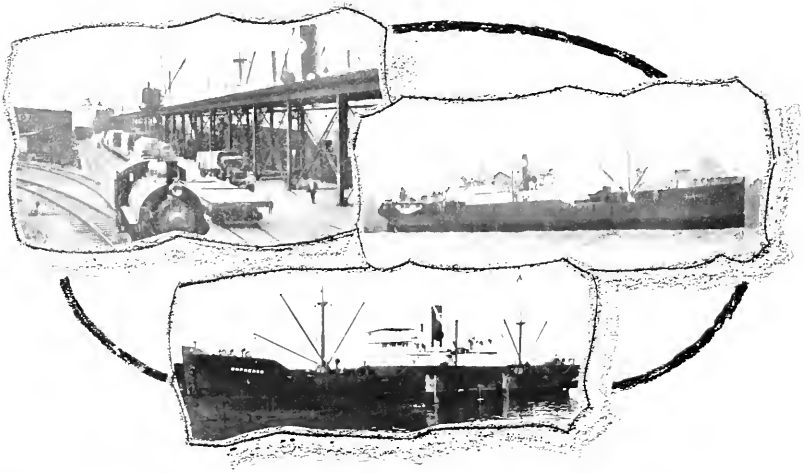
At the close of the war, and more particularly since the slump in world shipping brought about as an economic result of the war, American shipping interests have turned to the protected intercoastal shipping as an outlet for their surplus tonnage. For the past three years there has been a steady gain in ships and in cargo tonnage in this trade and there is reason to believe that there will be a steady gain in the future. According to the latest statistics from the United States Shipping Board, on September 30, 1923, there were engaged in this trade five passenger vessels of 26,980 gross tons, 151 cargo vessels aggregaing 859,698 gross tons, and 111 tankers aggregating 858,309 gross tons, a total of 267 vessels totaling 1,744,897 gross tons.

For the quarter ending September 30, 1923, there was a total movement of 3,365,000 long tons of cargo. Of this total 2,208,000 tons was petroleum in bulk moved in tank steamers from Southern California oil fields to the Atlantic or Gulf coast ports. This huge tonnage of oil explains the sudden rise of Los Angeles Harbor to the premier position among American intercoastal ports. During the quarter referred to above, Los Angeles Harbor handled 2,490,000 tons of cargo in this trade as against 1,588,000 tons handled at New York.

The movement of 1,157,000 long tons of general cargo employed a larger number and a greater tonnage of freighters than did the bulk oil movement of almost double weight. This is of course due in some measure to the longer period of turn-around required by general freight; it is also due to the sudden boom in the business attracting too many vessels.

There is every reason to believe, however, that with the continued growth of the Pacific slope in populatake the ship capacity.

With adequate cooperation from the Federal government our intercoastal services will absorb much greater Ameican tonnage and will make possible a much greater expansion of America's overseas merchant marine.



TRANSMARINE LINE

The [illegible] at Port Nea[illegible] the steamer Suraiico loading lumber at Portland, Oregon, and the motorship Suphenco.

INTERCOASTAL REFRIGERATIVE SHIPPING

By R. J. ALEXANDER

The writer of this article is a marine engineer who for twenty years has had vicarious experience in the growing and shipping of deciduous fruits from California to the eastern market. In this article he analyzes a few factors in the refrigerative shipping of green fruit which are not always considered but which, from the standpoint of both fruit shipper and ship operator, are very important.

CALIFORNIA shipments of fresh fruit under refrigeration have reached proportions which tax all the equipment of the railroads for their transportation and all of the resources and ingenuity of powerful marketing organizations for their distribution and sale.

In the season of 1921, as shown on the tables herewith, exclusive of apples, California shipped over 100,000 carloads of deciduous and citrus fruits. The average weight per car of the fruit and packages would be very close to twelve tons. In fact, a recent railway ruling gives citrus fruit a special carload rate on a minimum of fifteen tons. Taking twelve tons as a fair average, the 1921 shipments represent 1,200,000 tons. On the same basis the 1922 crop furnished 890,000 tons for fresh refrigerator shipment. Taking the pack of canned fruits and vegetables for 1921, we find a shipping weight of roughly 550,000 tons and for 1922 a pack of 1,100,000 tons. Referring to the tables again, 1922 shows a total dried fruit crop of 419,700 tons, or a grand total of fruit and vegetable shipments approximating two and a half million tons.

With such a tonnage in view it is no wonder that the intercoastal and the overseas steamship lines are all highly interested. They are, of course, getting their legitimate share of canned and dried fruit shipments and are, by the absorption of that and much other freight, relieving the strain on the transcontinental railroads, so that the roads are able to better care for the movement of refrigerator fruit express freight. The steamship companies have also carried fresh refrigerated fruit as partial cargoes.

But the question of refrigerator shipload shipments of fruit from Pacific Coast ports to Atlantic Coast ports has been agitated by both growers and steamship men intermittently for the past twenty years, and is now prominently in the public eye through discussion of rail rates on fruit shipments, through tremendous prospective increase in tonnage to be taken care of, and through cooperative marketing by the growers.

The purpose of this article is to follow the fruit through from the grower to consumer and see if we can get some suggestions which will be of use to our friends the steamship men and the fruit growers.

California Citrus Fruit Shipments

Season	Cars—Oranges	Lemons	Total
1900-01	.....	.....	24,900
1901-02	.....	.....	19,180
1902-03	.....	.....	23,871
1903-04	26,160	3,239	29,399
1904-05	26,044	5,378	31,422
1905-06	23,697	3,913	27,610
1906-07	26,313	3,507	29,820
1907-08	27,770	4,959	32,729
1908-09	34,320	6,196	40,516
1909-10	28,317	4,782	33,099
1910-11	39,630	6,764	46,394
1911-12	34,329	5,961	40,290
1912-13	15,893	2,192	18,085
1913-14	45,594	2,954	48,548
1914-15	40,011	6,851	46,862
1915-16	38,034	7,200	45,234
1916-17	46,417	7,944	54,361
1917-18	17,201	6,331	23,535
1918-19	39,307	10,023	49,330
1919-20	35,547	9,029	44,576
1920-21	48,075	11,807	59,882
1921-22	29,322	9,932	39,254

Collection

California is a large state with comparatively few harbors. The great deciduous and citrus fruit belt stretches over a territory 750 miles long and 125 miles wide. This is largely served by only two outlets—San Francisco Bay and Los Angeles Harbor. Geographically then there comes up immediately the problem of collecting steamer loads of fruit from small centers in the orchard districts and shipping this fruit under proper conditions to the steamer terminals.

All deciduous and citrus fruit for refrigerator shipment is picked from the trees in more or less green state and this fact makes necessary very careful supervision and handling of the fruit in every stage of its packing and transportation from the tree to the consumer. Different fruits require different treatment, but all require that the particular treatment best adapted shall be given with great exactness if the fruit is to reach the final consumer in good marketable condition.

The average haul (packing center to seaboard) for the deciduous and citrus fruits that are naturally tributary to San Francisco would be

California Fresh Deciduous Fruit Shipments

Number of cars north of Tehachapi—apples not included

Variety—	1917	1918	1919	1920	1921	1922
Apricots	403	440¼	419½	312	284¾	194
Cherries	330	356	335	194	665	592
Grapes	13,913¾	16,358¾	19,017½	24,280	28,529	37,132
Peaches	2,431¾	3,137	2,773½	3,148	3,333¾	2,315
Pears	480	4,571½	4,248¾	4,391	4,160¾	5,625
Plums	2,651¾	2,483¼	2,918¾	2,564	3,699¾	3,478
Sundry	66¼	75	49	241	236	164
Total cars	24,628	27,421¾	29,761	35,430	40,308	49,400

California Dried Fruit Output

	1917 Tons	1918 Tons	1919 Tons	1920 Tons	1921 Tons	1922 Tons
Apples	8,500	6,250	12,500	5,500	7,000	10,500
Apricots	15,500	15,000	15,500	9,500	12,000	10,250
Figs	8,600	9,200	12,000	12,300	9,000	10,950
Peaches	30,000	20,500	34,000	26,000	23,000	25,000
Pears	4,500	2,750	5,750	2,700	1,200	5,000
Prunes	100,000	45,000	140,000	97,500	100,000	120,000
Raisins	163,000	167,000	197,500	176,870	148,500	235,000
Total tons	348,100	265,700	417,250	330,370	280,300	419,700

California Canned Fruit and Vegetable Pack

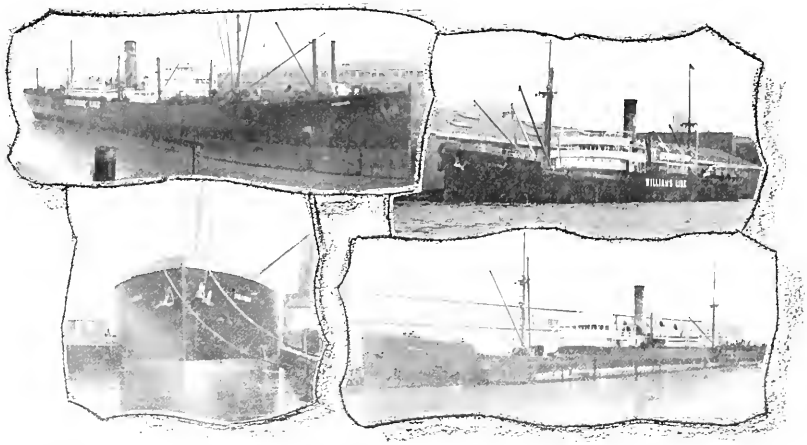
Year	Cases		
	Fruits	Vegetables	Total
1900	2,873,026	850,665	3,723,691
1901	2,837,982	1,119,703	3,957,685
1902	2,110,107	1,227,510	3,637,917
1903	2,928,515	1,466,475	4,394,990
1904	3,010,210	1,020,449	4,030,659
1905	3,450,037	1,277,141	4,727,178
1906	3,612,660	1,961,840	5,574,500
1907	3,180,469	2,186,650	5,667,119
1908	5,242,078	1,609,325	6,851,403
1909	3,561,173	1,370,605	4,931,778
1910	4,771,156	2,495,825	7,269,981
1911	4,835,404	2,786,905	7,622,309
1912	5,463,730	3,072,835	8,536,565
1913	4,852,090	2,404,870	7,256,960
1914	6,918,120	3,292,490	10,210,610
1915	5,731,166	2,607,214	8,338,380
1916	7,021,975	4,225,070	11,247,045
1917	9,995,145	6,947,769	16,942,911
1918	8,943,737	8,285,820	17,229,557
1919	13,696,403	7,051,519	20,747,922
1920	11,382,863	5,249,946	16,632,809
1921	8,511,851	2,615,947	11,127,798
1922	15,477,865	6,913,371	22,391,236

about 150 miles; for those tributary to Los Angeles Harbor 75 miles. This haul for best condition of fruit should be refrigerative and the fruit should immediately go into refrigerator storage at terminal awaiting loading on steamer. The short haul refrigerator tariff would represent quite an item in the total cost of transportation, and at present labor prices, the loading and unloading of the car, the stacking and unstacking in terminal cold storage, and the stevedoring into the steamer would be very expensive, bearing in mind that fruit packages must be handled carefully at every stage.

There is sufficient volume and the volume is increasing so rapidly that considerable outlay in terminal engineering and special transportation equipment would be amply justified. We suggest that to handle refrigerator, rail-water-rail, shipments economically, refrigerator cars should be constructed so that their tops could be removed and the fruit packages in one-half carload lots packed into skeleton steel crates, which could be handled by crane into and out of cars, terminal warehouses and steamer without manual labor of any sort. The present practice of loading refrigerator cars is to place the packages by hand in rows lengthwise of the car, starting with the first tier and the lower layer on the car floor, with the ends of boxes against the end wall of car, and the rows spaced with about two-inch ventilating space between the sides of the boxes. Car strips of ½ by 1 inch pine, a little shorter than the inside width of the car, are nailed in pairs across the upper edges of each box in each layer, one end of each strip bearing against the car wall and keeping the rows lined up. The fruit packages are built up thus from each end of the car to a sufficient height to make the carload. When the load is completed the space between the doors is vacant and here 2 by 4 inch pine bracing is wedged in to tighten each row and the car is ready for its journey. If the individual package is to be handled by ship stevedores after this manner there will be some large stevedoring bills to pay.

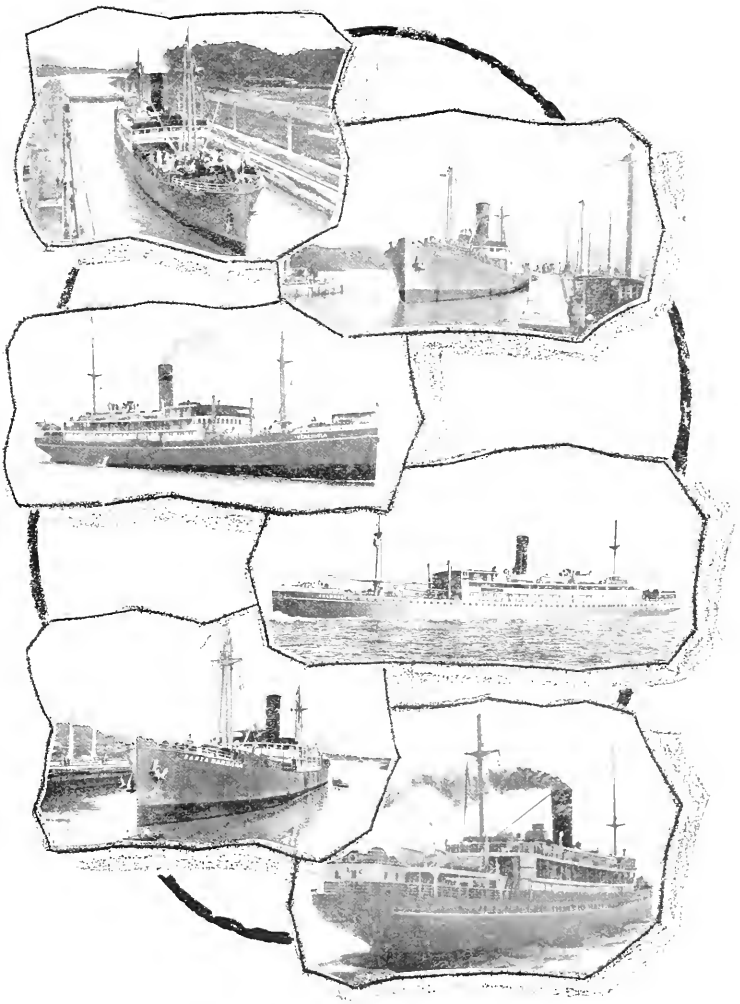
Terminals

There are no suitable terminals with suitable refrigerator equipment available for handling California fruits, either at San Francisco or Los Angeles Harbor on the Pacific end or at New York or any other Atlantic port; so that if we are to build terminals they should be designed and constructed with the idea of reducing to a minimum the handling of the fruit package. By the coordinated use of cranes, carriers, ships' tackle in combination with properly designed refrigerator warehouse and some such method of loading cars as described above, it might be possible to carry California fruit to the eastern consumer not only at a reduced tariff but also, and of ever more importance, in a vastly better marketing condition.



WILLIAMS LINE

[illegible] the [illegible] Willhide in port at San Francisco receiving and discharging intercoastal cargoes.



PACIFIC MAIL STEAMSHIP COMPANY.
In the above arrangement you'll see the steamers Ecuador, Venezuela and Colombia, carrying passengers and freight through the Panama Canal. Also we have the Pacific Mail intercoastal freighters Santa Clara, Santa Paula and Santa Barbara.

Steamer

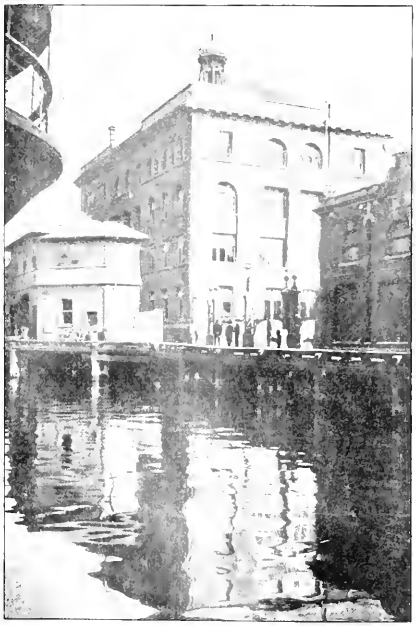
The refrigeration of the fruit on shipboard is an engineering problem that has been worked out by a number of very reliable and competent American firms. There is no doubt that fruit can be kept more nearly in the same condition as shipped on shipboard than it can in iced cars. It can within reasonable limits be kept exactly at any desired temperature and with any specified ventilation. The operating cost of refrigeration on shipboard with a competently handled plant is very low.

The over-all operating cost, however, per ton freight capacity is very high on the refrigerator steamer because at a slightly higher total operating cost and a higher capital value, the cubic freight capacity is substantially reduced, and practically all refrigerator shipments have high cubic volume in proportion to their weight. The table herewith shows the shipping weight of various California fruits in standard packages.

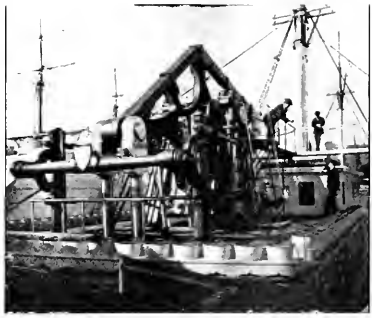
The installation of refrigerating machinery and the insulation of cargo space reduce the cubical capacity of an 8000 or 10,000 deadweight ton steamer by about 20 per cent. The low weight to space ratio and the spaces required for the circulation of cold air would further cut the capacity by at least 50 per cent, so that an 8800 deadweight ton steamer would carry not more than 3500 tons of standard fruit packages.

Distribution

The 100,000 carloads of fruits going out of California are distributed over the whole United States



A South Pacific port scene



and adjacent countries, some going to Europe through transshipment at Atlantic ports. Probably the content of 50,000 of these cars is consumed within one-day freight schedule of the Atlantic seaboard. If some arrangement could be made that would divert rail shipments to suit the arrival of steamer loads and a terminal at each of the important Atlantic ports was built and located to best advantage for distributing the fruit to market, here is ready to hand one way cargoes for a large number of steamers.

The problem is not so much a steamer operation problem as an engineering problem of collection terminal storage and distribution. Its successful achievement would be worth many millions to the fruit growers of California, and it should be worked out and controlled from the angle of the fruit grower.

Selling price of fruit dependent on market conditions and quality of product is more important than cheap transportation. The only way that these factors can be reconciled is by a thoroughly coordinated rail and water or truck and water service with ample specialized terminal facilities.

Standard California Fruit Packages

Package	Outside Dimensions—Inches	Fruit	Weight in Lbs.
Standard box.	$11\frac{1}{2} \times 12 \times 19\frac{3}{4}$	Apples	49
		Pears	49
Half box	$5\frac{3}{4} \times 12 \times 19\frac{3}{4}$	Apples	26
		Pears	26
Crates 4-basket	6″ x 17″ x 18″ Maximum	Apricots	23
		Grapes	30
		Peaches	25
		Plums	25
Standard box.	$11\frac{1}{2} \times 11\frac{1}{2} \times 24$ Inside box dimension	Oranges	78
		Grape fruit	74
		Lemons	78
Half box	$5\frac{3}{4} \times 11\frac{1}{2} \times 24$	Oranges	39
		Grape fruit	36

CURIOUS CRAFT OF OLDEN DAYS

Some Reminiscences of Steamer Navigation on the Pacific Ocean Fifty Years Ago

By SEA FLAME

HOW many of Pacific Marine Review's readers remember the old steamer Moses Taylor which many years ago ran to Australian ports from San Francisco. She was one of the old single cylinder beam engines, operating paddle wheels with boilers of low-pressure type, with salt feed from jet condensers. The boilers were very old and thin. It was said that when the black gang men went into the boilers to scale and clean, they were compelled by the chief to take off their shoes, as it was his fear that a heavy kick would put a hole through almost anywhere.

However, while the old Moses Taylor was not the most palatial thing afloat, there were some steamers under the British flag plying between San Francisco and Sydney, Australia, that were fearfully and wonderfully engined. Particularly so, was the City of Adelaide. This vessel had a pair of cylinders, low-pressure, set in the bottom of the hull just above the crank shaft. There were four cranks, two for each cylinder, the latter setting between them just above the shaft. The piston rods came up through the top of the cylinder, and there were two rods, about 18-inch centers. These were fastened to a crosshead which worked up and down much as our beam engine rods do, but the connecting rods came back from this cross-head to the cranks. This made a very long rod, which was fine, but as a mechanical contrivance it was wonderful. There were, as will be seen, four connecting rods, two to each engine. It required good adjustments to keep them even and equal in length.

The valve gear (slide valves, double ported) was not of the well-known Stevenson type, but these valves were actuated by what was then known as the single loose eccentric system. There was one eccentric sheave and gear for each engine. This sheave was fitted to a sleeve which was a working fit on the shaft. The sleeve had stops or recesses cut in one end, and on the shaft was pinned a stop. This stop was so designed and arranged that when the engines were working ahead the proper lead was provided for.

The eccentric rods had a socket arrangement into which the valve stems entered. Through both was a heavy flat deep key, fitted with a lever and stop so it could be pulled out, thus disconnecting the valve stem from the eccentric rod. A long lever was then inserted into a hole in the valve stem, and with a proper fulcrum the valve could be hand operated. As the engines were reversed by this contraption the shaft revolved in the sleeve, carrying the eccentric until it came to the position of backing, when the stop held it. The "gab-lever" would then be thrown in and the engines would start backing fine. While it seems quite an operation as described here, it actually could be readily and quickly done. Some of the engineers became quite expert, and by close watching could handle the engines by only disconnecting the valve stem of one of them, though it was orders to use both.

The air feed and bilge pumps were operated by a large eccentric, the jet condenser being between the two cylinders. The pressure, maximum, was 16 pounds. Often, with bad coal and hot weather, we were lucky to get half of that. And still she wobbled along at a 10-knot gait. But, oh, the coal she ate. Four pounds per I. H. P. per hour, and more at times, with the brine pump going all the time pumping out the saturated water, with more sea water being pumped in to keep her around "two-thirty-seconds."

Perhaps some of the younger ones will wonder what a brine pump was. Well, it was to pump the water out of the boiler when the pressure of steam was not sufficient to blow it out. And with a deep ship and low steam this often happened. So to be sure, it was pumped out. And woe to the man who closed that pump down without orders from the chief. It was a temptation to do it sometimes, to ease the ingoing feed, and thus help to get steam (there were no feed heaters then), but the result at the end was fatal. A saturated boiler, and a roasting from the Old Man.

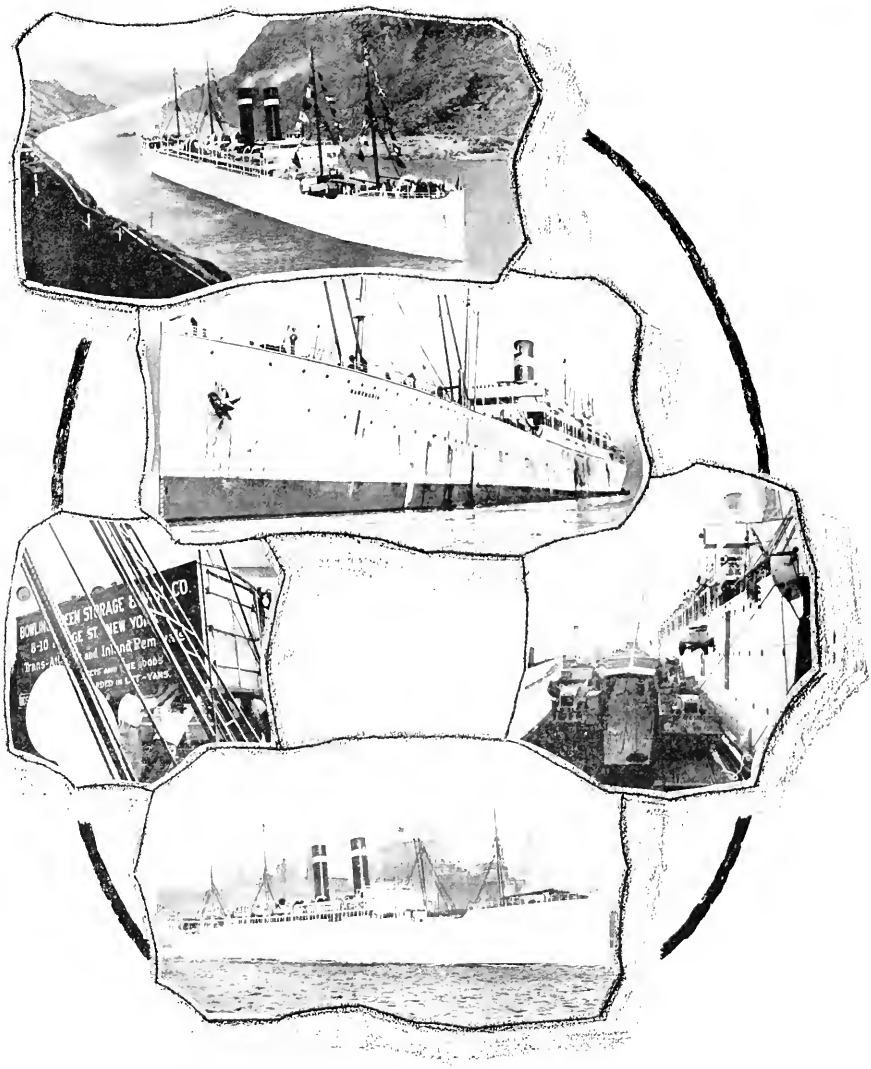
And these steamers did not have electric lights, nor refrigeration, nor fans, nor much else than a propelling engine and its boiler. There was one pump for the deck, but this was seldom used, as the old-fashioned canvas draw-bucket was mostly used in washing decks. The boilers were of the Martin type, square as a house with furnaces flat on the sides, a bit rounding on the tops, and with a water-leg each side with no water below. It was called a dry-bottom furnace. The lumb or steam-chimney went up through the end of the boiler in sort of bee-hive effect, forming a steam dome. The whole thing was made of small plates and short tubes, about four inches in diameter, as in those days the making of long tubes in one piece had not been developed to its present perfection.

The propeller was six bladed, it being thought necessary to have that many at least to produce results. There were also a great many other weird things; for instance, tallow cups on the cylinders. These were brass hemispherical receptacles, holding about a quart, were open at the top and connected to the cylinder by a plug cock with a wooden handle. The greaser's job was to get a charge of melted tallow into the cylinders at least every hour. To do this he first filled the cup with the fluid, hot tallow, and then, watching the stroke of the engine, opened the wooden handled plug cock when that end of the cylinder was exhausting. The vacuum would suck the tallow down and all was lovely, except when the cock was opened at the wrong part of the stroke and steam blew the hot tallow all over the place, while execrations were heaped on the unfortunate greaser by the engineer and a watch below was taken up swabbing and washing the mess away.

A South Sea Pioneer

About forty-five years ago the writer was chief engineer of a paddle-wheel steamer built to run on the Rewa River in the Fiji Islands. This job was considered to be, at that time, about the best up-to-date

(Continued on page 76)



PANAMA PACIFIC LINE.
The Finland, Kroonland and Manchuria carrying passengers and freight in the intercoastal trade.

Pacific Marine Review

THE NATIONAL MAGAZINE OF SHIPPING
576 Sacramento Street, San Francisco
339 AT 30 CHURCH STREET, NEW YORK

J. S. HINES, Publisher
A. J. DICKIE, Editor
PAUL FAULKNER, Publicity Manager
BERNARD N. De ROCHIE, Business Manager

Official Organ of the Pacific American Steamship Association and the Shipowners' Association of the Pacific Coast.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879.

Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 20th.
Subscription price, a year (domestic).....$2.00
(foreign)..... 3.00
Single copies ..... .25

FOR AN AMERICAN MERCHANT MARINE

"THE American people want a merchant marine. Their necessities demand it. Their dignity requires it."

These words or others to the same effect have formed the texts for innumerable speeches and articles through all the years since the close of the Civil War. In the statement of this text there is a remarkable unanimity.

When it comes to treatment of the text, however, we find just as remarkable a diversity and especially is this true when we examine the proposed methods for maintaining an American merchant marine in competitive overseas commerce. As master minds from every profession and occupation and of every shade of political hue have made attempts on this text a considerable degree of diversity must be expected, but what are we to say when steamship operators, steamship owners, steamship builders, steamship officers display in each of their separate spheres total lack of agreement as to policies?

We must agree with a certain senator in one congressional investigation who said to the steamship men: "Gentlemen, if you will go home and agree among yourselves as to what it is you want done and then tell us we will try to do it."

Subsidies, discriminating duties, discriminating tonnage taxes, naval reserve pay for merchant mariners, mail subventions, and many other schemes find ardent opponents and just as ardent supporters in every department of shipping.

Right now the chief need for the maintenance of the American merchant marine in foreign trade is a working agreement among American shipowners on some definite policy that is simple and concrete enough to go through at Washington. We do not require twenty-three resolutions which are tabled and forgotten. We do require one resolution to which the whole strength of shipping will be heartily given.

Now we are all agreed that some assistance to the American ship is necessary in offsetting the lower operating cost of the foreign ship. We have many times tried to get direct subsidy and have always failed. We always will fail unless we can devise some way by which funds for subsidy can be obtained without disturbing existing Federal revenues.

With this thought in mind we suggest a serious consideration of the plan so tersely expressed by W. M. Campion, vice-president and general manager of the Garland Steamship Corporation,—"Levy a tax or duty (equal to not less than the difference between the operating cost of the American ship and that of the foreign ship) on all foreign flag vessels whenever they are trading between this country and any country other than their own."

This would equalize the cost of transportation and would give American vessels an opportunity to compete in many trade routes now largely monopolized by foreign lines. This equalization would be irrespective of the disposition of the additional revenue thus acquired. That revenue might with profit be used in rebating to American foreign traders the additional freight tariffs necessary along the routes effected. This plan does not bind Congress to any payments to American shipowners, it simply applies a protective tariff to the business of American marine transportation.

There is no relief to be found in further separation or in divorcing the maritime interests on the Pacific Coast from those on the Atlantic. There is on the contrary every reason right now for greater unity among the shipping interests, and for one definite policy which we can "put across" in real fashion, and then go to the next step.

Much needed: "A statesman who can rise up to the emergency, and cave in the emergency's head."
—Artemus Ward.

Bricks Without Straw

OUR most eloquent Shipping Board commissioner, Edward C. Plummer, likens the present plight of the Board to that of the Israelites in Egypt under Pharaoh that knew not Joseph. Says he, "Congress is asking the Board to make bricks without straw."

This is a very apt figure and the commissioner might have carried it a little further and shown the contrast between the intentions of Pharaoh and those of Congress. For whereas Pharaoh's chief interest lay in the destruction of the Israelites, the avowed purpose of Congress is the preservation of the American merchant marine. The Israelites were preserved in spite of Pharaoh's evil intentions; let us hope that the American merchant marine will grow and prosper in spite of the good intentions of Congress.

There are many indications that the American merchant marine is prospering in spite of all notions to the contrary. In fact, were it not for the great fleet of idle ships that beclouds our horizon, American marine business never looked brighter than at the present time.

Read the history of our Intercoastal Service in this issue and ponder the possibilities. If that is not enough read the Shipping Board Report as interpreted in the next editorial.

Is Robert Dollar a confirmed optimist? Why is he establishing a round-the-world freight and passenger service under the American flag now?

"We do not need more government; we need more culture. We do not need more law: we need more education."

Shipping Board Sales

THE Seventh Annual Report of the United States Shipping Board shows that for the fiscal year ending June 30, 1923, the ships sold "included 71 steel cargo ships aggregating 347,799 deadweight tons, and realizing $8,725,372; 10 steel vessels sold for conversion to diesel machinery aggregating 64,911 deadweight tons and realizing $564,500; and 44 steel tankers of 412,420 deadweight tons, whose aggregate sale price amounted to $18,875,004.90. In addition there were sold 8 old or damaged vessels, 13 sea-going steel tugs, 4 wooden tugs and 233 wood and composite vessels sold for scrapping."

Taking the steel seagoing vessels in good condition we have a total of 125 vessels aggregating 825,130 deadweight tons.

The point that we wish to stress is that comparing this total with any prewar year, there is evident a very lively interest in the ocean-going trade. This deadweight tonnage of 825,130 translated into gross measurement tons would give at least 500,000 gross tons of steel seagoing ships that had passed into the ownership of private American citizens from government ownership during that year. From the report of the Commissioner of Navigation we gather that the shipyards of America added to our privately-owned merchant seagoing fleet at least 120,000 gross tons, giving a total addition of 620,000 gross tons for the fiscal year. This total is considerably more than double the average annual addition to our steel seagoing merchant tonnage for the ten-year period begore our entrance into the war, or from June 30, 1908, to and including June 30, 1917.

Another interesting item of the report of the Commissioner of Navigation shows that on June 30, 1923, there were documented as owned by the Shipping Board 6,861,241 gross tons of seagoing vessels and as under private ownership 6,242,547 gross tons of seagoing vessels. Of these totals on June 30, 1923, the Shipping Board had 3,813,404 gross tons and private American owners 612,587 gross tons of idle laid up shipping. So that on June 30, 1923, private American owners had 5,729,960 gross tons and the Shipping Board 3,047,837 gross tons actively engaged in intercoastal and foreign trade, or a total of 8,777,797 gross tons.

Bearing these figures in mind let us examine Commissioner Plummer's conclusions on the sale possibilities faced by the Shipping Board. Says he, "Our only course is to select the most directly effective legislation for our shipping and put it in force regardless of (competitors') squeals. Then the bulk of our ships could be sold, thus providing the aid funds necessary for their operation and be consumed in service instead of idleness. . . . We ask no share in any nation's carrying trade except our own. . . . To handle a major portion of cargoes going out of and coming into the United States. Five million tons of efficient shipping will do that."

We have just shown that there are now over eight million tons of American shipping actively engaged in the seagoing trade, and that private capital is absorbing tonnage as rapidly as could be expected even under good normal conditions. It would seem therefore that the American ship market is rapidly approaching saturation and that there is very little hope of selling the idle laid-up tonnage for any purpose other than scrapping or conversion.

A general state of indecision—U. S. S. B.

Shipping Board-Emergency

AS we go to press the cheering word comes from Washington that President Coolidge has, so to speak, taken the Shipping Bull by the horns and is making an earnest attempt to untangle the skein of government regulation of shipping.

If the dispatches as published in the daily press are correct, this untangling will take the form of an absolute divorce between the Shipping Board and the Emergency Fleet Corporation. Assuming these dispatches to be correct, we hasten to shout Amen! and add a lusty Hallaluja!

It is proposed that the two bodies get back to first principles and original functions.

The Emergency Fleet Corporation is to be the administrator and executive in charge of the maintenance and operation of the government-owned fleet under the guidance of a Shipping Director responsible to either the Treasury or Commerce Department.

The Shipping Board is to be a regulatory body like the Federal Railway Commission, and as such to be entirely free of the burden of five million tons of idle shipping. The Shipping Board gets a decree of divorce—the Emergency Fleet Corporation gets the property settlement.

Pacific Marine Review has consistently maintained that some such procedure was the "way out" for the government's shipping problems and we heartily endorse the stand which President Coolidge and Senator Jones are taking.

We wish to suggest that Congress in framing legislation enabling this move, put no restraint on the new director of shipping as to sale of the idle fleet. These ships should be sold or scrapped as promptly as possible and it will make no difference to American shipping in the final analysis whether they are bought by Americans, Armenians, British, Portuguese, or Greeks. They cannot be run profitably by anybody in competitive world shipping.

We believe that a change to this method will be beneficial to American shipping and that it will be possible under an Emergency Fleet Corporation, as proposed, to show a much greater efficiency in agency operation and a much more prompt and economical settlement of claims and bills than is possible under the present practice.

FEDERAL SHIPPING LEGISLATION

Abstracts of a Few of the Marine Measures Included in the 3200 Propositions which were Submitted to the Present Congress in the First Ten Days of Session. A new Jones Bill, Revised Registration Statutes, Working Steam Pressure, Immigration, and other Subjects

BY SPECIAL WASHINGTON CORRESPONDENCE

OF course in the first few weeks of every Congress a very large number of bills are introduced and the present Congress is apparently trying to break the record. As I write, December 15, **the first ten days of Congress have brought forward for analysis and reference to committee 3200 propositions in the Senate and 3100 in the House.** (At that, hove to over Sunday, the Ship of State is logging 13.3 legal knots per hour, which is about right for a good modern freighter.) Conditions are congested to such a degree and the Government Printing Office is so overcrowded with work that it is impossible to even secure copies of these bills, let alone find the time for reading and analysis.

However, here are abstracts from and comments on a few of the more important measures. After the holidays, when there comes a lull in the begetting of bills and the more active congressmen pause for breath, we will be able to give Pacific Marine Review's readers some more comprehensive idea of what is doing at Washington in maritime legislation.

Aids to American Shipping: Senator Jones has incorporated into S. 485, which he has just introduced, provisions similar to those in the subsidy bill of last year relating to the carriage of governmental supplies and employes on American vessels when possible, the securing to American ships of as nearly one-half of the immigrants as possible, and the establishment of a joint board by the Interstate Commerce Commission and the Shipping Board to study and make recommendations relating to the coordination of rail and water traffic. The board and commission are given authority to effectuate such recommendations by such means as are granted them by law.

In S. 482, Senator Jones proposes the imposition of a 5 per cent ad valorem duty in excess of the existing duty on all goods imported in vessels other than vessels of the United States. Where goods are now on the free list, a $2\frac{1}{2}$ per cent ad valorem duty is proposed when so imported.

On vessels of American registry, Senator Jones proposes to levy a tonnage tax of 6 cents per net registered ton; on American-built but foreign-owned vessels, a tax of 30 cents per net registered ton; and on all other vessels a tax of 50 cents per net registered ton. Provision is made in the bill (S. 482) for the termination of existing treaties so as to make the enforcement of the above provisions possible.

In another measure (S. 487) it is proposed by Senator Jones that fifteen months from the passage thereof all treaties shall be terminated unless they do not, or within the fifteen months are not so modified that they do not, prevent the United States from levying discriminating duties and tonnage taxes.

Registration of Vessels: Section 4132 of the Revised Statutes is proposed to be amended in S. 729, by Senator Jones, to read as follows:

"Sec. 4132. Vessels built within the United States and belonging wholly to citizens thereof, and vessels which may be captured in war by citizens of the United States and lawfully condemned as prize, or which may be adjudged to be forfeited for a breach of the laws of the United States, being wholly owned by citizens, and no others, may be registered as directed in this title."

The same measure proposes further that the Act of August 18, 1914, providing for the admission of foreign-built vessels to American registry for the foreign trade, be repealed.

Mr. Greene of Massachusetts has introduced the same bill in the House (H. R. 3216).

Pollution of Navigable Waters: This subject now seems to be very active and quite a large number of bills have already been introduced in both the Senate and House to prevent the discharge of oil refuse into the navigable waters of the United States. The bills are so numerous I am not attempting to quote the context of any one or all of them.

The introduction of so many bills upon this matter, however, together with the admonition of the President in his address to Congress that—

> "Cooperation with other maritime powers is necessary for complete protection of our coast waters from pollution. Plans for this are under way, but await certain experiments for refuse disposal. Meantime laws prohibiting spreading oil and oil refuse from vessels in our own territorial waters would be most helpful against this menace and should be speedily enacted"

furnishes reason to believe that hearings will be held again in this regard and that some regulatory law will be enacted.

Working Steam Pressure—Hydrostatic Test: By S. 838, Senator Fletcher proposes to amend Section 4433 of the Revised Statutes so as to make the working steam pressure on boilers discretionary under the rules and regulations of the Board of Supervising Inspectors instead of the working steam pressure laid down by existing law.

This bill also provides for the amendment of Section 4418 of the Revised Statutes so as to make the ratio of pressure for the hydrostatic test discretionary with the Board of Supervising Inspectors under its rules and regulations, which are to be approved by the Secretary of Commerce, rather than the present provisions of that section which lays down a ratio of 150 pounds to the square inch to 100 pounds to the square inch of the working steam pressure allowed.

Motorizing of Vessels: Representative Edmonds has presented a resolution (H. J. Res. 41) authorizing the Shipping Board, in its discretion, to use the construction loan fund provided for in Section 11 of the Merchant Marine Act for the purpose of converting the present owned ships of the United States into motorships. It is understood that Representative Edmonds will, in the near future, introduce a bill containing many provisions beneficial to American shipping.

Limitation of Immigration: A bill has been introduced in the House (H. R. 101) by Mr. Johnson, and in the Senate (S. 35) by Mr. Lodge, providing for the limitation of immigration and the inspection of immigrants at ports of departure. The bill defines "immigrant" as all but government officials, aliens coming

for a temporary visit, or in transit from one place in the United States to another via foreign contiguous teritory, and seamen.

Immigrants not subject to the quota restriction, termed "non-quota immigrants," are wives, husbands, fathers, mothers or unmarried minor children of citizens of the United States; aliens returning from a temporary visit abroad; aliens who have resided for seven years in adjacent countries, their wives and unmarried minor children if accompanying them; members of recognized learned professions and highly skilled labor of a class certified as not to be procured in the United States when the admission of such highly skilled laborers has been previously authorized, and the wives and unmarried children of members of such professions or skilled laborers if accompanying them or following to join them; bona fide students, and aliens who served in the military or naval forces of the United States during the world war.

Immigrants subject to the quota restrictions, being all those not included in the above two classes, are divided into "quota immigrants" and "quota-relative immigrants." "Quota-relative immigrants" are the wives, husbands and unmarried children of aliens who have been legally admitted to the United States, have resided in this country continuously for two years, and who have declared their intention to become citizens at least one year before filing a petition with the Commissioner General of Immigration. This petition must set forth facts establishing that those named therein are "quota-relative immigrants" and if the commissioner finds the petition to be true, he will authorize the consular officer to issue a "quota-relative" certificate.

Every immigrant, non-quota, quota and quota-relative, must file an application for and receive from the United States consul a certificate that he is one of these classes, for which certificate a charge of $2 is proposed. In the case of "quota-relative immigrants" application must first be made to the Commissioner General, but in all other cases application need only be made to the consul. No more quota and quota-relative certificates are to be issued than the quota allowance for the year, which is declared to be 200 for any nationality plus 2 per cent of the number of aliens of that nationality residing in the United States according to the census of 1890. But authority is provided to issue quota certificate to immigrant although he is a "quota-relative" or a "non-quota" immigrant, provided that the total number is not increased.

Aliens about to go abroad for a temporary visit may secure a permit to re-enter upon payment of a fee of $6, but this certificate is only evidence of his intention to return to the United States and is not made the exclusive means of establishing that fact.

Nationality for the purpose of the proposed law is determined by the place of birth similarly to the provisions of the existing quota law.

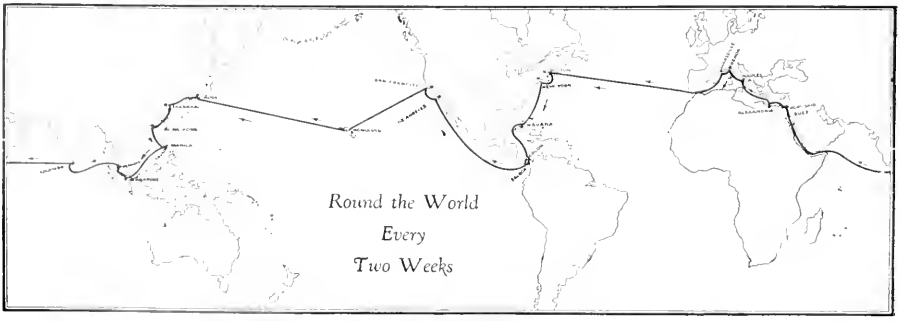
For bringing in immigrants without certificate who are inadmissible, a fine of $2000 is to be imposed that may be remitted by the Secretary of Labor under conditions substantially the same as those provided in existing law.

Alien seamen of a class excluded from regular admission must be detained on board the vessel, unless landed temporarily for medical treatment or under regulation to be prescribed, under a penalty of up to $2500 for each failure so to detain them. Vessels departing, or attempting to depart, with a lesser number of seamen ineligible to citizenship than they had when they arrived are subject to a penalty of not less than $3000 nor more than $10,000 multiplied by the difference between the number of ineligibles brought in and taken out as seamen. Landing cards are also to be issued to seamen before they are allowed to go ashore. There is no doubt that these provisions are a further effort to prohibit the employment of Asiatic seamen along the same lines as the existing regulation requiring a $500 bond.

Many other bills affecting immigration have been and will be introduced. Their purport is to repeal the literacy test, enlarge the quota limitation, exempt certain classes, deport aliens convicted of violating the Prohibition Act, requiring all aliens to register, deporting those who fail to become citizens within a certain time, and many other purposes, but the Lodge-Johnson Bill seems to have the support of the administration and no doubt will furnish the basis of consideration of this subject.

President Coolidge, in his annual message to Congress, urged a more careful limitation of immigration and since the present Quota Law expires in June, 1924, it is necessary that some immigration measure be enacted to become effective before the existing law expires. I am unable to say at this time just what the provisions of the new law will be but the Lodge-Johnson bill seems to have the approval of those connected with immigration enforcement.

An effort is being made to have the provisions of the Ship Subsidy Bill of last session securing to American vessels the carriage of 50 per cent of the immigrants incorporated in any new immigration law that may be enacted.



Diagrammatic map of the world showing the route of the Dollar round-the-world service and the ports at which these steamers will touch. Note the arrows—the service is all in one direction—continually westward. Cargoes and passengers are picked up en route for westward movement only. No return cargo problem.

WORLD'S YOUNGEST SHIPBUILDING FIRM

A Group of Pasadena School Boys Organized for the Design and Construction of Miniature Ships Produce Many Models of Famous Vessels and Replicas of Marine Scenes

THE youngest group of shipbuilders in the world today is the organization known as the Internationally Famous Good Brothers of Pasadena, California.

About two years ago Roscoe W. Good, age 19, and his brother Wallace S. Good, age 17, formed an organization for the purpose of designing and constructing replicas or models in miniature of ships, railways, engineering works, terminals, marine scenes, or of any construction for which a demand existed or for which a demand could be developed.

The organization thus started grew, and valuable connections were made with large and reputable steamship, railway, hotel and engineering firms until now Good Brothers of Pasadena have achieved a fairly international reputation for skill in craftsmanship, fidelity to detail, and honesty in business dealings. As at present constituted, the following organization is kept fairly busy.

The Organization

Executive Department, Roscoe W. Good, age 19. Sales, business management, publicity, six assistants.

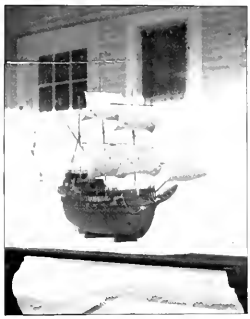
Construction Department, Wallace S. Good, age 17. Construction, finishing, shipping, ten assistants.

Engineering Department, Ercell B. Harrison, age 19. Marine, railway, general, seven assistants.

Drafting Department, L. Adolph Schmuck, age 17. Three assistants.

In addition to their business duties, the department heads are all taking full time courses either in high school or college. Some of the assistants are adult craftsmen, some young men putting in part time and taking full courses at school.

The routing of work through the offices, drafting, engineering and construction departments is thoroughly organized. In the office all correspondence is systematized and a careful follow-up maintained. On receipt of an order for a model accompanied by the necessary

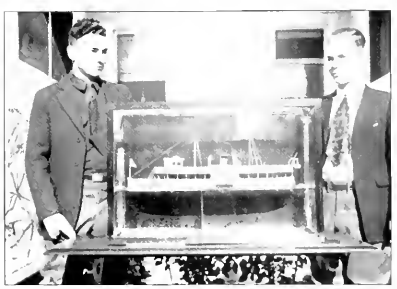


Replica of the Pilgrim ship Mayflower, presented to the President of the United States by Good Brothers of Pasadena for placement in the cabin of the presidential yacht Mayflower.

blue-prints, a consultation between the heads of construction, engineering and executive departments decides what parts of the work shall be made under engineering and what under construction. The drafting chief is then called in and entrusted with the preparation of the necessary detail drawings to scale.

Construction Department

The usual method of ship hull modeling is to match plain white or sugar pine planks to a thickness of about five-eighths inch. Enough planks are prepared so that when glued together one on top of the other they make a block large enough to cover the entire hull model as desired. On each of these planks on the smooth top surface is laid out to scale the contour line of the ship's hull corresponding to the position the plank is to take in the hull model. The planks are sawed to the contour line and then glued together. The wood carver fairs up the lines accurately, and after the whole has been thoroughly sandpapered to remove all tool marks, the hull is ready for the deck erections and fittings. If it is to be a working steamer model there will of course be more work in preparing the interior for proper placing of engine and in boring for shafts.



Roscoe W. and Wallace S. Good with a model of one of Wrigley's famous glass-bottom boats

Engineering Department

While the construction department is working on the hull, the engineering department will be busily engaged in preparing all the fittings and in making miniature engines and other machinery for working models. If the model is to be complete in every way there will be a great amount of small detail work for the engineers to handle. While the modern steamer does not look nearly so complicated a job for the modeler as does the old sailing ship, still there are many pieces of machinery on her deck, and the customer usually desires that these shall be completely detailed. So the engineering department has to make faithful replicas in miniature of windlasses, cargo winches, ventilating cowls, cargo booms, boom supports, boom fastenings, blocks, bitts, devils claws, hawse stoppers, hand steering gears, steam pipes, stacks, stack stays, whistles, sirens, lights, stanchions, wireless antennae and connections, and many other details. All of these are finished and painted in the exact colors to match the original, and then turned over to the construction department for assembly in the finished model.

The construction department meantime has been working out the deck superstructures and the masts, which are also carefully painted and matched to the original before being fastened in place on the hull. The finished model is then carefully inspected and checked, and after any miss-

ing details have been supplied or possibly faulty details remedied she goes to the finisher who carefully touches up the paint and adds the completing touches.

Delivery

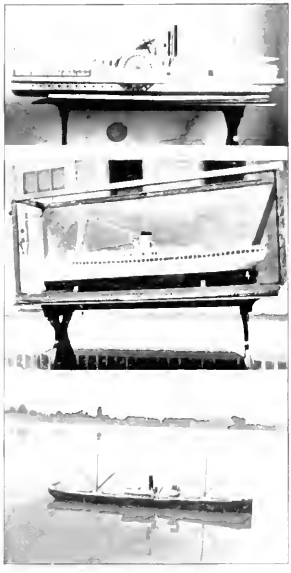
A photograph is now made and sent to the owner with notification that the replica is ready awaiting inspection or shipping orders.

Uses of Model

In the good old days of American shipbuilding, when the Yankee shippers were the pride of the sea for speed and smartness—whenever a ship was to be built—

"First with greatest care and art
A perfect model the master wrought
That should be to the larger plan
What the child is to the man—
Its counterpart in miniature."

The lines were carefully molded on the model first and afterwards lifted and expanded to the full-sized vessel. In the design and construction of fast sailing yachts the great Herreschoff Brothers used this method and some yacht builders still use it. American shipyards in the modern sense, however, scarcely ever build a model, and if they were called upon to furnish a model with any particular vessel they would undoubtedly avail themselves of the highly developed organization of Good Brothers rather than temporarily organize a model construction department in their own plant.



Top — 85-year-old model of Hudson River steamer Isaac Newton as restored by Good Brothers for Edwin Eldridge of New York. Center—Replica of Wrigley's Catalina steamer Avalon. Bottom—Working model of a Shipping Board freighter.

Models or replicas of ships, drydocks, terminals and marine scenes are useful in a great many ways commercially in addition to their puely decorative or sentimental effect. Steamship firms use models of their vessels in various ways to advertise their services to the public, and have found it profitable to make large expenditures in placing marine exhibits at expositions. Full models, longitudinal and cross sections, X-ray models, replicas of any engineering work, scenes at sea, lifesaving works, working models, storm effects, or any combination to any scale can be worked out to order by this organization. Their experience is at the command of prospective model users, to aid in selecting the proper display for any given purpose.

The famous Good Brothers have recently completed for the President of the United States a perfect replica of the original Mayflower, which is to be placed permanently in the cabin of the Presidential yacht Mayflower.

CURIOUS CRAFT OF OLDEN DAYS

(Continued from page 69)

thing afloat. She was light draft, 22 inches, and some 160 feet long, with a beam of 30 feet. She had diagonal disconnecting engines with a clutch so that the shaft could be made as one for long runs or disconnected, so that one engine could be worked ahead, while the other backed.

She was about 400 I. H. P., and did good work as a river tug, being owned and operated by a big sugar mill company. The crew were all natives except the pilot and engineer, these being white men. As she ran all the time in sweet, fresh water, she was a good job for us, as we did not have much to do except make a trip down the river about 20 miles twice a month.

Most of our time was occupied lying at the wharf, cleaning up, and keeping the natives busy at some sort of work. For instance, when laid up for a week, it was the custom to whitewash the insides of the furnaces after they had been nicely swept. The boiler was covered with felt, and lagged with mahogany strips, hooped by brass bands, and this was kept varnished and highly polished. The decks were kept white as snow, and when coaling all fuel was brought on board in clean sacks. She was more like a yacht than a tug boat, and the writer remembers well the many pleasant hours on board. There was never any hurry or rush. Take it easy, or as the natives say it, "Marlua."

A Missionary N. A. and M. E.

But there was another boat on the river that was surely a wonder. She had been built by a missionary and, as he was neither a shipbuilder nor an engineer, the result can be imagined. All his help were natives and the finished "steamer" was a curio. The hull was flat bottomed, slightly pointed at each end; was about 50 feet long and 8 feet beam, with 4 feet depth of hold, or hull, as deck she did not have.

And the motive power—shades of Watt and Fulton. It was an old traction engine, built by the Fowlers nearly 50 years ago. It had a small boiler with the engine mounted on top, its single cylinder of 6-inch bore and 8-inch stroke turning a fly wheel, the shaft of which was geared to turn the traction wheels when running on country roads. These wheels, however, had been taken off and in their place a couple of paddle ones fitted. The whole arrangement was most crude, but marvelous as it may seem it went, like Ford's first Lizzie.

Still, being flat bottomed, it was a trial to keep her on even keel, with an equal submergence of paddles. She would take a list, and then with one wheel deep and the other flipping and skittering in the water, she would yaw and turn wildly. The missionary would then chase the crew to the high side, and after a lot of balancing she would steady up, and puff along at a three-mile gait. It was surely funny to watch the missionary, who was master, mate, chief engineer and purser, standing carefully in the center of his craft, noting her every move. He had a long, flowing blonde

(Continued on page 78)

Oil Engines and Motorships

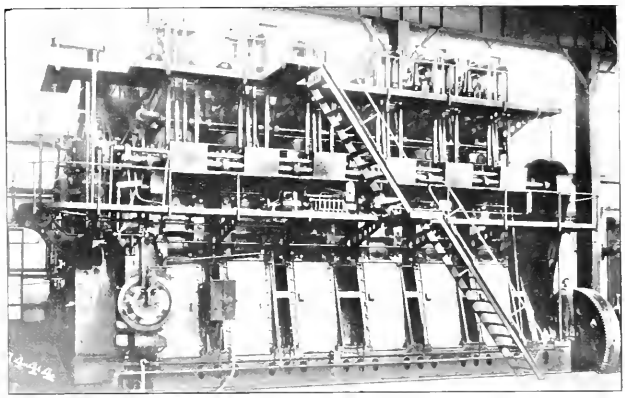
LARGE AMERICAN DIESEL

A 2250 Indicated Horsepower Marine Diesel Engine Developed and Built by the McIntosh & Seymour Corporation

THE McIntosh & Seymour Corporation recently completed a large marine engine of 2250 indicated horsepower. This engine is of the vertical, single-acting, four-cycle, cross-head type, and is directly reversible. There are six working cylinders, each of 28-inch bore and 48-inch stroke, and at 115 revolutions per minute a rated horsepower of 1700 is developed.

The compressor is of the 3-stage type and is mounted on the forward end of the engine, while at the after end is mounted a thrust bearing of the Kingsbury type.

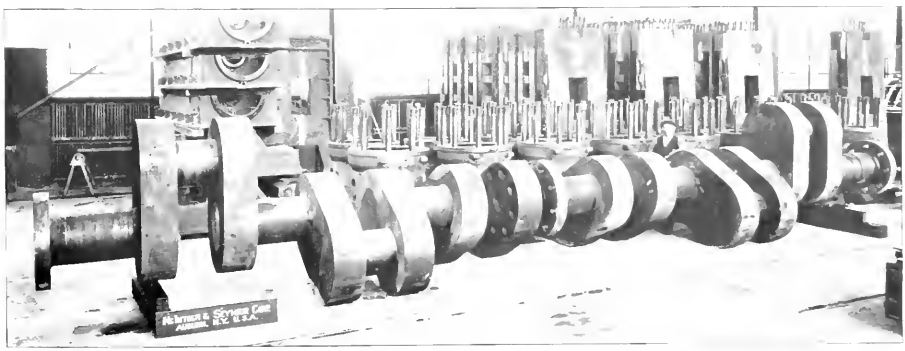
The whole engine is built to comply with the rules and regulations laid down by the various classification societies operating in this country, the principal ones being the American Bureau of Shipping and Lloyd's Register of Shipping. The scantlings of the various parts, therefore, are such that they come within the rules of either society, so that it is only a matter of arranging for physical tests, for these engines to be built directly under either society's rules.



McIntosh & Seymour marine type full reversible diesel engine, 6 cylinders, 2250 indicated horsepower. Note electrical control lower left.

The weight of this engine is approximately 318 tons, which gives a weight per indicated horsepower of 315 pounds. The engine is so designed that right and left hand engines can be easily built and so twin-screw arrangement in the ship can easily be taken care of.

The maneuvering gear is at the forward end of the engine and is electrically operated.



Built-up crank shaft for McIntosh & Seymour 2250 indicated horsepower engine

Group of A-frames on huge planer at the shops of the McIntosh & Seymour Corporation. This illustration gives an excellent idea of the size of castings.

The general arrangement of the engine follows closely that of the smaller types of marine engines which have been built by this corporation for so many years and which are in successful operation in a large number of American ships.

The fuel valve, which is the most important part of a diesel engine, is made by the corporation under the Hesselman patents, being fitted with the Hesselman pulverizer, claimed to be the most effective means so far devised for the preparation of the fuel for burning in a diesel engine cylinder. This pulverizer gives maximum efficiency with prompt and complete combustion and does not need to be varied with the different grades of fuel that are met with from time to time.

With the Hesselman pulverizer these varying conditions are of non-effect, the same pulverizer being suitable for the heavy Texas "C" boiler oil as for the lighter oils of approximately 30 to 32 degrees Baume gravity.

The fuel pump follows the usual system adopted by McIntosh & Seymour, of having a separate plunger for each cylinder. Each one of these plungers is driven by an eccentric strap which is mounted on an inclined eccentric on the pump driving shaft. This inclined eccentric is moved endwise by a collar, so that when the strap is at one extreme it runs centrally with the shaft and gives no stroke to the plunger. At the other extreme the strap has maximum eccentricity and the plunger has a full stroke corresponding to maximum delivery of fuel.

In addition to the hand control of the fuel pump stroke which controls the speed and power of the engine, each pump is under the control of an automatic safety stop which is mounted inside a case at the forward end of the pump shaft. This safety stop, which is operated by a small centrifugal governor, is so arranged that when the engine reaches about 10 per cent above normal speed a lever comes into operation in conjunction with other smaller levers to lift all the suction valves on each individual pump, thus putting them out of action, in which condition they remain so long as the speed is above normal. Fuel can be cut off from individual cylinders if desired by the hand operation on the smaller levers mentioned above.

This arrangement gives a very flexible job in so far as the engine can be turned over with only one cylinder firing if at any time it is required to do so.

The maneuvering gear on this engine is a notable departure from the previous designs of maneuvering gear turned out by this corporation, and in fact by diesel engine builders in this country, in so far as it is electrically operated instead of being operated by compressed air, and is so arranged that the operator has only to work one lever to control the whole of the maneuvering.

The gear is made up with three sets of levers, which are synchronously arranged under the control of an electric motor, so that each movement of the operating gear is timed to take place at the correct moment.

For running ahead the speed of the engine is controlled over the quadrant on the left-hand side of the control ring, and for running astern the speed of the engine is controlled on the quadrant on the right-hand side of the control ring. To bring the engine from ahead to astern the control lever is pushed downwards and around the control ring to the extreme top part or starting position on the astern quadrant, and while the lever is passing around the ring from one quadrant to the other, the electrical mechanism operates the links and levers controlling the rocker shaft, which lifts the rollers of the air, exhaust and fuel valves from contact with their cams, while another movement shifts the cam shaft endwise, bringing the astern cams under the rollers, which then return to normal position, whereupon the ordinary sequence of operation takes place that usually occurs for starting up on any engine.

A valve is provided whereby the injection air is automatically cut off, while the cycle of operations, for moving from ahead to astern or vice versa, is taking place.

Should only a small movement of the mechanism be required for changing the stroke of the fuel pump a very small amount, two push buttons are provided, one for increasing and the other for decreasing the fuel pump stroke. The push buttons close one of two circuits, which set the mechanism controlling the fuel pump stroke in operation and only while the operator's finger is on either of these buttons can any movement take place.

A two-way switch is provided for diverting the current from the master circuit to the small subsidiary circuits to which these push buttons are connected, so that it is not possible to have the current flowing through the circuits for general maneuvering and the circuits for the subsidiary operation of the fuel pumps at the same time.

A red lamp placed above the mechanism and lighted continuously is indicative as to whether current is available for maneuvering. If there is no current available, then the lamp is no longer lighted.

(Continued from page 76)

beard, and was given to lifting his soul in song. While in the middle of a hymn the Bull Frog (which was the name we gave her) would start heeling. The song was chopped off quickly, and hurried orders to trim ship issued. Perhaps the crew, fired with zeal by the song, would take to the high side with too much of a rush, and away she would careen. But the blonde bearded missionary never seemed to lose his temper, and I often wondered if his spirit of resignation and resourcefulness was not worthy of emulation.

The old Bull Frog carried many a cargo of yams and taro roots to the lower part of the river, and in spite of her crudeness helped the missionary in his work with the natives. The Bull Frog and her master have gone the way of all flesh these many years.

DIESEL ENGINES & HYDRAULIC TRANSMISSION

By A. C. HOLZAPFEL

THE question of adapting the huge fleet of Shipping Board vessels, now lying idle, for profitable employment in the ocean-carrying trade has been before the public eye for some time. The consensus of opinion seems to be that, in order to enable these vessels to successfully compete against European vessels, they must be fitted with the well-known and most economical diesel type of oil engine.

Such engines, of the reversible and direct acting type, are made in the United States by some six or eight eminent engineering firms. So far they are under these disadvantages:

Firstly: They are very expensive.

Secondly: They are not being produced on an economical, standardized type.

Thirdly: The propeller speed of these engines is not as economical as it would be with a slower running engine; in other words, most of these vessels would get the best propeller efficiency at 60 to 75 revolutions, while their diesel engines are mostly designed for 120 revolutions and upwards.

I have already, in a previous article, advocated what might be called a "comprehensive scheme of standardized manufacture" to deal with this problem, by which all these vessels could probably be put on the sea under private management within the next four or five years, and by which they would be able to successfully compete against the many more or less obsolete steamers which still plough the seas under various flags.

Manifestly it would be better for the world at large that the older steamers, many of them over fifteen and twenty years old, should be scrapped, rather than the comparatively new, modern, and in many respects well equipped, vessels which were built in this country three to five years ago and are now lying idle.

In order to accomplish this, they should remain the property of the Shipping Board or the United States government till they have been refitted, because this can only be done under a comprehensive scheme and the financial resources of the government alone are large enough to deal with this task.

Now the most economical method of propulsion would be by high speed, non-reversible diesel engines, combined with the hydraulic transformer or transmitter of Professor Fottinger of Danzig Technical High School.

My reasons for advocating this combination are the following:

Firstly: Non-reversible, high speed diesel engines running 300 to 400 revolutions are being manufactured on a large scale, chiefly for moderate sized electrical installations, and are absolutely reliable, requiring very little attention.

Secondly: They can be made in standardized units at the lowest possible cost, and there are no patents to be considered. Their design is public property.

Thirdly: Their weight would be less than half that of a reversible, slow speed diesel engine and their cost less than half.

Fourthly: There would be a splendid market for similar engines for generating electricity.

Coming now to hydraulic transmission, I may explain that the Fottinger transformer consists of a centrifugal pump attached to the driving shaft of the prime mover (in the present case of the diesel engine). This centrifugal pump would deliver water to a forward turbine, or a reversing turbine, both attached to the driving shaft of the propeller. According to the form and size of the turbines the number of revolutions can be adjusted as required. The most economical reduction is from four or five to one, so that a diesel engine or prime mover running 300 to 400 revolutions could reduce to 60 to 80 revolutions on the propeller shaft, thus giving the highest propeller efficiency.

The working of the whole installation is the simplest conceivable. When getting ready to start the diesel engine or engines are set going, the water impelled by the centrifugal pumps meanwhile going through a by-pass. A lever is fitted to a valve, through which the water passes, and while this stands in center the water goes through the by-pass and does not touch the turbines. According to how you move the lever, one way or another, the water passes to the forward or reversing turbine and the passage can be so accurately regulated that you can give a single or half a revolution either way. The action is absolutely instantaneous and there are no jars or shocks.

The transformer also constitutes an elastic cushion between the diesel engine and the propeller shaft, and racing is entirely abolished.

The loss of power by such an installation as described would be about 8 per cent against about 16 per cent in electrical transmission, the weight would be less than half of that of electrical transmission and the cost probably less than one-fifth, particularly if the transformer be manufactured on a large and standardized scale. There is very little wear and tear on the transformer. So far as I can julge, there would be a substantial saving in weight and first cost of this combination, as compared with a direct acting, reversible diesel engine and the 8 per cent loss of power would probably be compensated for by increased propeller efficiency.

There are in the main three types of vessels now laid up which could be refitted under this scheme:

Firstly: The Lake type, needing, say, 1000 brake horsepower.

Secondly: The 8000 to 9000 ton deadweight vessels, needing 2000 brake horsepower.

Thirdly: The 11,000 to 12,000 tons deadweight, needing 3000 brake horsepower.

The first could have one six-cylinder, non-reversible diesel engine of about 1100 horsepower.

The second could have two such engines, delivering water to one forward and one reversing turbine, i. e., to one propeller shaft.

The last could have three such engines, all delivering water to one set of turbines on one propeller shaft.

All the propellers and shafting as now fitted could be utilized and considerable space, now occupied by the boilers, could be made available for cargo.

In conclusion, I may say that the second Fottinger transformer ever built was built for my account and placed into a cargo vessel driven by suction gas engines, called the Holzapfel I, built in 1910. This vessel made twenty-three seagoing coasting voyages with cargo from British ports. The two years' experience proved to my satisfaction that this transformer is an absolutely reliable appliance.

The patents of the transformer must by now have expired and it would not be difficult to arrange with their late owners to give the necessary details as to designs and latest developments against a moderate compensation.

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

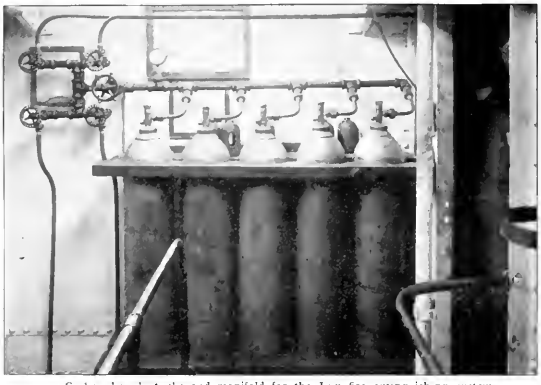
LUX SYSTEM PROTECTS MOTORSHIPS MOONLITE AND CASCO

THE installation of the Lux fire extinguishing system on the motorship Casco is the first one on the Pacific Coast and it is anticipated that this will be the forerunner of many more. The Pacific Steamship Company has ordered the Lux system for its motorship Moonlite now being reconstructed at Todd's Shipyard at Seattle.

The Lux system covers primarily the cargo holds, paint and lamp lockers and can be extended to the fuel oil tanks. The extinguishing agent is carbon-dioxide stored in liquid form in steel cylinders which are connected by manifolds and thence piped to the various compartments to be protected. Carbon-dioxide as a gas is inert, heavier than air and will not support combustion, and when admitted to the presence of a burning mass will prevent more oxygen entering and thus extinguish the fire. The gas is harmless to all sorts of cargo, whether foodstuffs or steel.

In the case of the motorship Casco the gas cylinders are stored in a rack fitted in the upper engine room casing where the cylinder valves and control valves to cargo spaces are very accessible.

The method of operating is simple. Fire being detected in the hold, the hatches are closed tight, ventilators are turned from the wind and covered as in usual practice. The valve controlling the line to the compartment on fire is opened, the main stop valve next opened and then cylinder valve is last opened and carbon-dioxide released. The gas flows in liquid form to the end of the pipe and immediately upon reaching the opening expands, forming gas. The gas being heavier than air sinks down over the cargo and penetrates between boxes or bales, effectively cutting off the supply of oxygen.

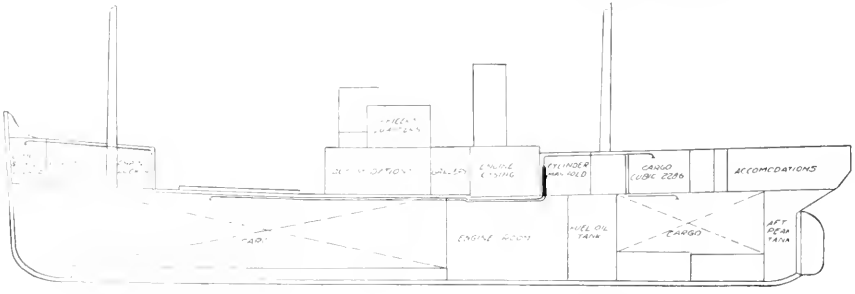


Carbon-dioxide tanks and manifold for the Lux fire extinguishing system on motorship Casco

The amount of carbon-dioxide gas necessary to be released is tabulated and copies of the tabulation are given to the officer in charge of the ship. Each cylinder is capable of extinguishing fire in 1800 cubic feet of space.

Carbon-dioxide gas as an extinguishing agent has long been known but difficulty was experienced in the distribution so that it would not freeze in the pipes. The Lux system of releasing and distributing has overcome this difficulty.

The Lux system is represented on the Pacific Coast by E. S. Hough, through whose courtesy Pacific Marine Review is enabled to publish the foregoing description of these interesting installations.



Inboard profile of motorship Casco showing piping for Lux fire extinguishing system

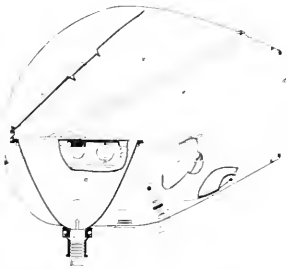
A Glareless Headlight

CONSIDERABLE attention has been given of recent years to the production of various devices calculated to take the glare out of automobile headlights, and in this work there has been brought out some very interesting developments which may be of considerable value in the marine field.

A design of lamp known as the Woodlite developed in San Francisco has marked a radical departure from the ordinary course pursued in eliminating glare.

As will be noted from the vertical sectional drawing reproduced herewith, this lamp consists of a 6-inch paraboloid reflector arranged to throw the light from a lamp at its axis in a vertical direction against an oblique projecting reflector. From this reflector the beam of light is projected horizontally and in a downward direction through a vertical slit $\frac{1}{2}$ inch wide and 4 inches long. All of the rays from the light source pass through this opening. None is intercepted and they are all projected below the horizontal plane of the upper edges of the slits.

In this vertical section through the lamp **a** is the 6-inch paraboloid reflector, and **b-c** the inclined reflector, redirecting and reshaping the light beam as it is received from **a**. Both reflectors are manufactured from sheet brass, highly polished and silvered; they are mounted so that they constitute a rigid, complete unit. All light rays meet in a vertical line at the aperture **d** before leaving the housing **e**. The housing is pressed from light-gage sheet-steel stock and black enameled. The focusing aperture **f** permits a minute adjustment of the position of the filament in all directions. A small spherical reflector used for side lighting is indicated at **g**. The cover **k** is held securely in position by the clamp **h**. The weight of one lamp complete is approximately 7 pounds.



Sectional elevation of the Woodlite

The lamp is made also in another type, having a circular aperture only 1 inch in diameter. In this latter type none of the light rays from the source are intercepted. The light is held below 42 inches and the beam spreads laterally from 30 to 40 feet, thus lighting an entire roadway.

One of the most important features of the light from this lamp is that a uniform intensity is maintained across the top of the light field and the highest intensity is on that line, thereby bringing the greatest light effect at a distance instead of close to the car. The spread of the beam is about 100 feet at a distance 200 feet in front of the car.

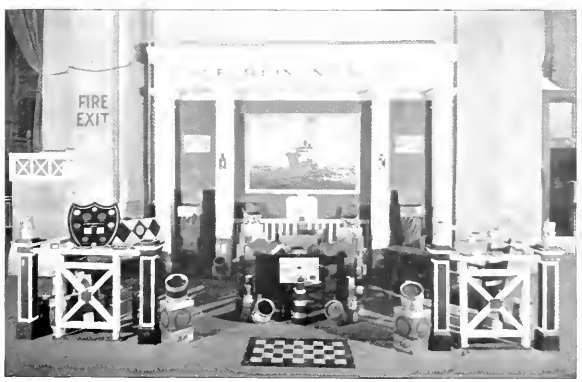
These lamps give perfect beam control and it is in this connection that they should be of interest to the operators of workboats and pleasure craft, as it would be a comparatively easy matter to arrange this design so as to give in effect a compact and very efficient small powered searchlight at comparatively low cost.

The basic patents of the Woodlite are controlled by the Berkeley Light Corporation of San Francisco, and a company is now being organiedz to manufacture this product on a quantity production basis.

Marine Glue Exhibits

AT the recent Marine Exposition in New York many visitors were attracted to the booth of L. W. Ferdinand & Company by a large and striking painting of shipping activities in New York harbor which was hung in the center between the massive columns which formed the background of the space.

The scene was painted for the occasion by Fred J. Hoertz of Wilday & Hoertz, and the remarkable precision of each and every detail certainly proves the artist's knowledge of harbor life.



The Leviathan was the central figure passing through the Narrows between Bay Ridge and Staten Island. Sufficient other craft were in sight to make an old harbor tow boat captain feel right at home.

The picture was of particular interest to L. W. Ferdinand & Company, as it exhibited the largest existing demonstration of Jeffery's Marine Glue, there being over 16,000 pounds of that material in the deck seams of the Leviathan.

Representatives of the Ferdinand company who were present at their space to explain the various uses of Jeffery's Marine Glue and show specimens and samples of their products, received many congratulations on the appearance of their booth and many expressions of admiration for the painting.

L. W. Ferdinand & Company will also exhibit at the Motorboat Show to be held January 4 to 8 inclusive, and representatives of that company will be there to answer questions regarding the application of the various grades of their product.

Stability and Trim

Stability is a very important factor in naval architecture and a quality without which no ship can be of service. Practically, however, stability is rather an elusive factor which is seldom considered until after it has disappeared.

Some years ago in Great Britain there was devised an instrument known as the Ralston Stability and Trim Indicator, the object of which is to supply a handy prompt method of determining the actual stability and trim of a vessel under any varying load conditions.

The Ralston stability and trim indicator

This instrument as at present manufactured consists of a steel plate carried in a suitable frame, which may be balanced on trunnions both longitudinally and laterally. Upon this steel plate is engraved the inboard profile of the particular ship for which the instrument is being built, this profile showing the capacities of the various cargo spaces. The plate with its frame is mounted on trunnions in a box, the cover of which, as shown in the illustration, contains a frame in which are mounted to scale trim curves and G. M. curves, together with instructions for their use. In drawers in the bottom of the box there are weights to scale, so that any possible combinations of loadings on the ship can be reproduced in miniature on the capacity plan in the instrument.

On the framework of the steel plate carrying inboard profile there are two sliding weights operated by thumb screw ratchet and sliding on transverse and longitudinal scales. Having reproduced the loading of the ship on the instrument the framework is raised on its trunnions and balanced by moving these weights. The scale reading of each weight is then carried up to the sliding rule on the curves in the cover and the trim and the stability of the ship under that loading condition are read directly from these curves.

Detailed view of the table and weight drawer of the Ralston stability and trim indicator

The Ralston Stability and Trim Indicator is manufactured to order by E. R. Hough, Ltd., of London, who is represented in the United States by E. S. Hough, 16 California street, San Francisco.

* * *

RADIO COMPASS INSTALLATIONS

THE Kolster Radio Compass, manufactured by the Federal Telegraph Company of California, has often been described in the columns of Pacific Marine Review. This device is the most practical radio navigating instrument yet devised.

We are very glad, therefore, to note the increasing use of this instrument as shown by the following table of installations:

United States Lighthouse Service:
- Tulip
- Sequoia
- Orchid
- Madrono

United States Coast Guard:
- Mojave

Pacific Steamship (Admiral Line):
- H. F. Alexander
- Ruth Alexander
- Emma Alexander
- Dorothy Alexander
- Admiral Farragut
- Admiral Dewey
- Admiral Schley
- Admiral Fiske

Standard Oil Company of California:
- J. A. Moffett
- S. C. T. Dodd
- R. J. Hanna
- F. H. Hillman
- K. R. Kingsbury
- W. S. Miller
- Richmond
- D. G. Scofield
- H. T. Harper
- W. S. Rheem
- H. M. Storey
- Lubrico

United States Shipping Board:
- President McKinley
- Leviathan

San Francisco & Portland Steamship Company:
- Rose City

Matson Navigation Company:
- Matsonia
- Maui
- Wilhelmina
- Manoa
- Lurline
- Manulani
- Manukai
- Mauna Ala
- Woonsocket

Army Transport Service:
- Grant

(Section continued on page 104)

PACIFIC MARINE REVIEW'S
WORKBOAT AND PLEASURE CRAFT
POWER

PLEASURE CRAFT ON THE PACIFIC COAST

THE year 1923 witnessed quite a revival in pleasure craft of various degrees of size and luxury of equipment all along the Pacific Coast of North America. Noticeable in this revival of interest is the number of large seagoing cruisers for combination sail and power which have been built for Pacific Coast owners both in Pacific Coast and Atlantic Coast shipyards. In this class of yachts there is a decided trend toward diesel-electric drive.

Another phase of the development which carries great promise for the future of yachting on the Pacific Coast is the revival of interest among young men in home-made speed boats. This has been accompanied by a large sale for marine power purposes of second-hand automobile engines and transmission, of which there is a practically unlimited supply at very low cost. In this section of last month's issue of Pacific Marine Review we indicated the great capacity of the Pacific Coast manufacturing plants for the building of heavy duty marine oil engines of low and medium power. What was said there about our engine-building plant applies equally well here in connection with the Pacific Coast plants for the building of hulls for work boats or pleasure craft in wood or steel.

The boat builders of Puget Sound, Columbia River, San Francisco Bay, and Los Angeles Harbor have built up a splendid reputation for superior workmanship and high class design, so that no Pacific Coast devotee of yachting need look further than his home harbor to obtain the very highest class of construction and the very latest ideas for outfitting.

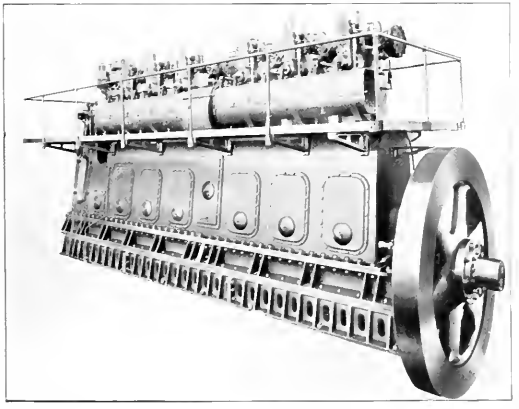
The increased activity in pleasure craft has brought about in practically all Pacific Coast harbors the installation of special facilities for the storage and care of such fleets. Yacht clubs have made large provision in this regard, which has been supplemented in many instances by municipal small boat harbors, in which it is possible to have the independent individual cruisers and yachts properly moored and supervised at minimum expense.

The pleasure craft industry on the Pacific Coast is looking forward to a record breaking year in 1924.

SMALL MARINE ENGINES FOR BRITISH COLUMBIA FISHING CRAFT

Consul General John G. Foster, Ottawa, Canada

Fishing craft in the northern part of British Columbia, including the Fraser River, may be equipped with small marine engines after January 1, 1924, under authority granted by the Dominion Government. The order is not compulsory, but it is expected that a large number of fishing craft owners will avail themselves of the permission granted. It is estimated by the department of marine and fisheries that there are about 4000 fishing craft in the region affected.



NELSECO DIESEL

The illustration herewith shows a 6-cylinder 4-cycle, trunk piston type Nelseco diesel engine, rated brake horsepower 600 at 205 revolutions per minute. At full load to 25 per cent overload the fuel consumption of this engine is .42 pounds per brake horsepower hour, at one-quarter load .67 pounds per horsepower hour. The overall dimensions of this engine are—length 27 feet; width 5 feet 8 inches; height above center of shaft 10 feet 10 inches; total height 13 feet 5 inches, approximate weight 115,000 pounds. One of these engines is now being installed in a Merritt, Chapman & Scott tug and another in a tug for the Transmarine Corporation.

A SHALLOW DRAFT CRUISING HOUSE BOAT

THE Harlan Plant of the Bethlehem Shipbuilding Corporation, Ltd., recently completed to the design of Henry J. Gielow, New York City, a beautifully fitted up steel house boat equipped for crusing in shallow waters.

This boat has a length on the water line of 101 feet 2 inches, length over all of 120 feet, a beam of 24 feet 8 inches, and draft loaded of 6 feet 10 inches. She is equipped with three masts and with a diesel engine driven propeller. The hull is of steel with steel deck beams and diagonal straps. The deck and the house are of teak.

The auxiliary equipment includes an electric ice machine, electric windlass, electric sailing winches, and hot water heating plant. Current for this machinery and for lighting is given by a 5-kilowatt generator, driven by a 4-cylinder gasoline engine.

Interior view showing living and dining rooms of shallow draft cruiser recently completed at the Harlan Plant of the Bethlehem Shipbuilding Corporation

There are accommodations for ten guests and for eight in crew. The owner's stateroom is equipped with separate bath and there are two communicating bathrooms serving the guests' rooms. As will be seen from the illustration herewith, showing the living and dining rooms, this boat is very tastefully decorated, cozily furnished, and will make a very comfortable floating home.

CURRENT AMERICAN SHIPBUILDING

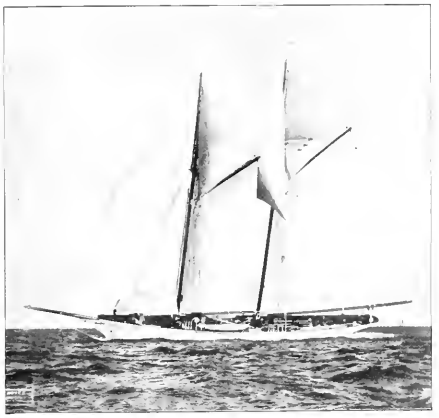
SEAGOING steel vessels under construction or ordered in American shipyards on November 1 aggregated 17 ships of 100,000 gross tons, according to the American Bureau of Shipping.

Without exception these were for the Great Lakes or coastwise service. None were building for the overseas trade.

The relative smallness of this total is realized when compared with the 6,000,000 gross tons of shipping launched in this country in 1919 as a result of the building program initiated during the war. From first place in the world, the United States has dropped to sixth place, and is now considerably below the prewar level.

Figures compiled by the Atlantic Coast Shipbuilders' Association show that supplementing the seagoing tonnage mentioned above are a miscellaneous assortment of river craft and other small steel boats, numbering 209 vessels of 60,351 gross tons, and eight wood ships of 1004 gross tons, now under construction.

These figures do not include any Navy Department vessels, of which there are one battleship, two aeroplane carriers, five scout cruisers and fifteen submarines under construction in private American shipyards and four auxiliaries, one patrol vessel and three fleet submarines building in Navy yards.



Alexander Smith's beautiful schooner yacht Cutty Sark now being equipped with Winton-Westinghouse diesel-electric propelling machinery at the Brooklyn plant of the Morse Dry Dock Company.

A NEW DIESEL-ELECTRIC YACHT

THE Cutty Sark is to be the next addition to the fleet of diesel-electric yachts, which includes the Elfay, Guinevere, Volero II, Alcyone, and others. She is owned by Alexander Smith and is being equipped with the Westinghouse-Winton propelling system by the Morse Dry Dock Company, Brooklyn.

The Cutty Sark was the former Ariadne, a steam-auxiliary schooner yacht. Her new propelling machinery will consist of two 100 horsepower Winton diesel engines, each of which drives a Westinghouse electric generator, which furnish power for a 150-horsepower Westinghouse motor connected directly to a single propeller. The controller for the propeller motor will be located in the pilot house, where the navigator will be able to control directly every movement of the yacht without signaling the engine room.

The satisfactory operation of the Elfay and other diesel-electric yachts is bringing this type of drive into increasing favor, because of its low operating cost, reliability, convenience, cleanliness, quietness and superior maneuvering ability. The diesel engine consumes much less fuel per horsepower hour than any other type of engine; and when combined with the electric drive it provides a highly flexible control. Tests of the Guinevere showed that she could be brought from full speed ahead to dead stop in less than fifteen seconds and to full speed reverse in less than twenty-five seconds. No other form of drive is capable of such rapid response.

The rehabilitation work on the Cutty Stark is in charge of C. D. Mallory & Company and Tams & King.

DIESEL-ELECTRIC DRIVE TUG

THE Pennsylvania Railroad has recently ordered a diesel-electric tug with many novel features. The following brief description of this boat and its machinery will be of interest:

The boat is to be 105 feet long, 24 feet molded beam, 10 feet molded draft, and 360 tons displacement. The hull is being built by the Staten Island Shipbuilding Company.

She will be single screw, driven by one double armature motor, 575 horsepower, 125 r. p. m. There will be two Winton diesel engines, 260 r. p. m. driving 235 kilowatt generators. In case of accident to either engine, or for economical cruising speed, operation may be had from one generator only.

In addition to the engine room control station there are two pedestal stations on the bridge. These two stations on the bridge will permit the helmsmen to control the motor from either side of the pilot house, a great advantage when the tug is working in small sea room or close to a large vessel. All auxiliaries will be motor driven. The Westinghouse Electric & Manufacturing Company is supplying all the electrical equipment.

The Pennsylvania Railroad looked into this type of drive very thoroughly before deciding, and they feel that they will have the finest tug on the East Coast when it is finished. The ease of operation and the flexibility, together with the reliability obtained, certainly make this system drive ideal for tow boats.

WORLD TRADE OPTIMISM

Some Words of Cheerful Outlooking for the Future of Pacific Coast World Trade

By WILLIAM PIGOTT*

SINCE the World War, America's eyes have been opened as never before to the need and possibilities of foreign trade. Under the leadership of Herbert Hoover, our Department of Foreign and Domestic Commerce is performing practical and beneficial service to the American business man in the development of foreign trade to an extent not surpassed by any other country in the world.

Our organization: This Council was organized for the purpose of concentrating the minds and efforts of the business men west of the Rocky Mountains and of the Pacific Coast to the necessity and advantage of developing foreign trade and its relationship to our domestic prosperity.

We must think in Pacific Coast terms—and I mean by Pacific Coast not only the seaport cities bordering on the coast, but all of the inland cities and country back to the Great Divide. While it must be expected, and it is well that every normal man should do everything possible to advance the interest of his own city, both commercially and socially, we cannot be either narrow or provincial. When it comes to the development of commerce and foreign trade, the best results can be attained for each by all pulling together because the problems are not local but national and international.

In our effort to build up our seaports we must not forget our back country. The development of our cities must go hand in hand with the development of the interior. If we build up the interior, the growth of the seaport cities will follow. For natural, conservative development, our seaports must grow only in proportion as they are needed as great service stations to distribute on the seven seas the products of the interior and in turn bring to the interior the products they need and desire from the outside world. Foreign trade is inseparably linked with agriculture and horticulture.

Our organization does not expect to bring big trade prosperity over night, but we do expect by persistent, intelligent effort to awaken and develop on the Pacific Coast a spirit of cooperation and team work that will take advantage of the growing opportunities of foreign trade and which will redound to the benefit of the farmer, manufacturer, importer, exporter and shipper alike.

We do not wish to infer that our bankers and business men are not alert to the situation or that they are not doing their share, but we need such organizations as ours to keep the fires burning because by so doing we awaken a general and concerted action that will bring all to realize that we of the Pacific Coast are awake to the possibilities of an ever-developing Oriental trade, that the Pacific Coast seaport must serve this trade, and that we of the present day must lay the foundations on bed rock so that its future greatness may be secure.

There are two types of pioneers. The first were those who came to the West in the early days and settled the land, laying the foundations of our cities. We are the second type and our work is to create industry at home and commercial trade abroad. It is our task to lay the foundations for our future commercial and industrial supremacy. If anything, we have the greater task to perform, as it is also our duty to create employment for the thousands of young men and women graduating annually from the high schools, colleges and universities of the West. Our courage is not lacking. The same high degree of courage that crossed the plains and mountains, watered the deserts, cleared the forests and laid the foundations of our cities is present in the western generation of today. We have the courage. We must not be visionary but we must have vision.

We on the Pacific Coast must take the lead and assume the initiative in the development of trade with Asia. The Pacific Coast ports, not those of the Atlantic, are Nature's gateways to three-fourths of the world's population and two-thirds of its raw products. The people of Asia, Australasia and the West Coast of South America are our next-door neighbors. We on the Pacific Coast must learn to understand them, as trade based on understanding and good will is on a sure foundation for future greatness.

Our problems on the Pacific Coast are somewhat different from the problems and economic conditions of the southern or eastern part of the United States and therefore may require different treatment. However, after a residence in the West of thirty years, I am fully convinced that if we all work together we can and will solve the problems ourselves.

Most of the big things on the Pacific Coast during the past fifty years have been accomplished through the efforts of local men who took up their residence here in early life or were born here. While for years we have reached out our hands courteously and invitingly to eastern financiers and manufacturers to come out and install industrial plants and help develop the West, up to the present time I have failed to note any great response.

While it is true that in some cases we have been benefited by the capital, brains and energy of the easterner, at the same time if you will take the trouble to investigate you will find that the large and successful business institutions—financial, manufacturing and shipping—in every Pacific Coast city were developed by the men who live out here, with the assistance of the local banker. Practically every bank of any prominence in Los Angeles, San Francisco, Portland, Tacoma and Seattle was founded, nurtured and developed by the citizens of those cities.

So, I want to strongly impress on everyone present the fact that we have the men, the money, the courage and the vision right here at home to do more and bigger things than we are doing at present if we mobilize our forces and work together in the right spirit.

It took Great Britain over two hundred years to attain her present strong position in world trade. Our work may seem slow and at times tedious, but never uninteresting. It is essential, for we are laying the foundation for future greatness. The primary work of this conference is to see that such work is well done.

Let me call to your attention the slogan of this convention: "Pacific Coast unity for world trade expansion." We are here to exchange ideas, to cooperate, to unify our efforts, to the end that the entire Pacific Coast—our seaports, our inland cities, and our farms—may benefit thereby.

*Abstracted from the President's address of welcome to the delegates at the Third Annual Convention of the Pacific Coast Foreign Trade Council, Portland, Oregon, November 18, 1923.

PACIFIC MARINE REVIEW'S BROADCAST STATION ·P·M·R·

Good cheer and glad tidings, in keeping with the Yuletide, reigned in San Francisco on December 24 at the picturesque pageant of nations held aboard the liner President Harrison when the ship was turned over by the Shipping Board to the **Dollar Steamship Line** for the Round-the-World Service to be inaugurated with a Chamber of Commerce Trade Extension Tour on January 5.

Fifteen nations to be visited by American trade emissaries on the first of the Dollar Steamship Line's fleet of seven 502-type steamers were represented by young women in costume of their native lands. Hands-around-the-globe from San Francisco, officially represented by Mayor James Rolph, Robert Newton Lynch, vice-president of the Chamber of Commerce, and by a score of leaders in shipping and mercantile affairs, was depicted by the gayly dressed ladies.

The formal transfer of the ship was made by F. W. Relyea, district manager of the Shipping Board, to R. Stanley Dollar, vice-president of the company, while the assembled business men applauded and expressed wishes of success for the world-circling freight and passenger route.

The importance of the new service to San Francisco as a world trade center was dwelt upon by Robert Newton Lynch, Charles H. Spear, state harbor commissioner, Phillip S. Teller, chairman of the Chamber of Commerce trade delegation, and Mayor Rolph; the addresses preceding the transfer of the vessel by Mr. Relyea.

R. Stanley Dollar discussed the magnitude of the undertaking of establishing a fortnightly schedule, for twenty-one ports steaming nearly 26,000 miles in 112 days for the round-the-world trip. He mentioned that the home port will be San Francisco, the general offices located here, which will result in the benefits of staff personnel, purchase of supplies, repairs in San Francisco yards, and the attraction of tourists from all sections of the country. The Dollar Steamship Line houseflag was turned over by Mr. Dollar to Captain K. A. Ahlin, who is commanding the President Harrison on the inaugural voyage.

* * *

Luckenbach Steamship Company, Inc., has placed the steamer Jacob Luckenbach in the intercoastal passenger trade. The vessel arrived at San Francisco on December 19 from New York carrying an excellent passenger list to California. The first eastward sailing will be January 8 from San Francisco. The comfortable vessel, which has heretofore been operated in the European and South American passenger trade, is 416 feet long, 53 feet 6 inches beam, 30 feet loaded draft, and is of 14,425 displacement tons. The Jacob Luckenbach has accommodations for eighty-five passengers. All rooms are located on the upper deck, all being "outside rooms." Each room has a square window, not a port hole, an electric fan, running water, and forced draft ventilation, which guarantees home-like quarters while in the tropics. There are also accommodations with private baths. The decks, salon and dining hall are commodious and well equipped. The Jacob Luckenbach is equipped with the most modern navigational devices, including the Sperry automatic self-steering instrument known in marine circles as "Metal Mike", which steers the wheel without the aid of a quartermaster.

Ralph E. Gilman, special engineer in charge of turbo-generator engineering of the Westinghouse Electric & Manufacturing Company, died in Los Angeles on December 5. Mr. Gilman, on account of illness, had been granted a leave of absence from his duties in East Pittsburgh, Pennsylvania. He was a graduate of Leland Stanford University, receiving his degree in 1898. He joined the Westinghouse Company soon after leaving college and served the organization in many important positions.

Here's where Pacific Marine Review introduces the three commanders of the I. M. M.'s Panama Pacific Line—namely, left to right, Captain William J. Munro of the Finland; Captain Thomas W. Garlick of the Kroonland, and Captain Adrian Zeeder of the Manchuria. Couldn't want a trio of better looking masters for our Intercoastal Edition!

Frank J. Shipman, president of the American Marine Association.

The annual meeting of the **American Marine Association** was held recently at the Waldorf-Astoria in New York and officers for the ensuing year were elected. Frank J. Shipman, of The Texas Company, was named president, succeeding Colonel E. A. Simmons. The other officers elected were: vice-president, Edward A. Colson, Babcock & Wilcox Company; treasurer, James Plummer, Newport News Shipbuilding Company. The members of the executive committee are: H. F. Alexander, Pacific Steamship Company, Seattle; S. I. Cooper, Southern Pacific Company, New York; James S. Milne, Todd Shipbuilding Corporation, New York; Colonel E. A. Simmons, Simmons-Boardman Publishing Company, New York; A. E. Allen, Westinghouse Electric & Manufacturing Company, New York; W. M. MacFarland, Babcock & Wilcox Company, New York; W. E. Sawhill, editor Marine Review, Cleveland; Captain W. H. Stayton, Baltimore Steamship Company, Baltimore.

* * *

T. A. Lee, Pacific Coast manager of the Furness-Prince Line, operating between Pacific Coast ports and the United Kingdom, announces two remarkable speed records for the route. The Furness-Prince steamer London Shipper, sister of the London Merchant and London Importer, departed from San Francisco on October 29 and arrived at Glasgow on November 25—time 25 days and 21½ hours; time to Panama, 10 days. The steamer London Merchant left Cardiff November 4, passed through the canal at 6 a. m. of November 20 and made Vancouver on December 3; time 29 days! Who can beat it? Speak up!

E. E. Helm has been appointed district manager at Detroit for the Bridgeport Brass Company. Mr. Helm is from Akron, where for two years he served as manager of the industrial bureau of the Akron Chamber of Commerce. Mr. Helm had five years' experience with the Goodyear Tire & Rubber Company in connection with the department of exploitation.

* * *

James A. Briggs, senior director of Messrs. William Briggs & Sons, Ltd., of Dundee, Scotland, manufacturers of bituminous products, visited our eastern trade centers early in December in connection with his firm's affairs, and returned home to Scotland on the Aquitania before the holidays.

* * *

The Bilge Club, with a representative gathering of Pacific Coast marine surveyors, naval architects, operating managers and shipbuilders, came into being recently at the Los Angeles harbor home of William Smith, veteran Lloyd's surveyor. The new organization, the port of Los Angeles honored with the home chapter, will soon take form in all other Pacific Coast ports, with membership limited to those directly connected with the physical operation and construction of ships.

Harry J. Summers, manager of the American Bureau of Shipping for the South Pacific district, presided as toastmaster at hte initial meeting in Los Angeles, which was attended by forty marine leaders. Among the speakers were: Charles Irwin, general manager of the General Petroleum Corporation; E. E. Remsberg, operating manager of the Shipping Board in Southern California; Frank Knitzel, consulting engineer of the Bethlehem Shipbuilding Corporation; L. E. Caverly, chief engineer of the Los Angeles Shipbuilding & Drydock Corporation; W. H. Wickersham, customs broker, and Captain S. E. Kennedy, United States inspector of hulls and boilers.

* * *

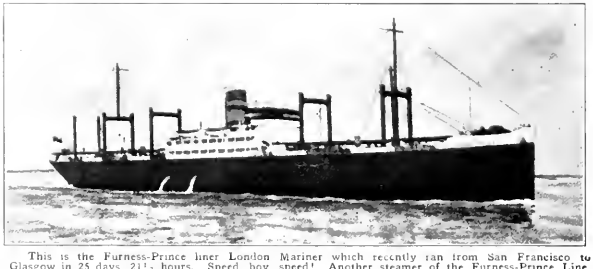
E. V. Murphy, formerly connected with the San Francisco Examiner Marine Exchange, has been appointed advertising and publicity manager for the various services of the Pacific Mail Steamship Company with headquarters at the general offices, 508 California street, San Francisco. Through his newspaper and advertising experience Mr. Murphy should prove a valuable asset to the Pacific Mail staff. The appointment of Mr. Murphy followed the resignation of Jackson D. Baker, who has entered other promotion fields.

* * *

A. Y. Duel, general manager of the Federal Telegraph Company, announces the opening of a high-powered marine radio station at Portland, Oregon, for use in communication with ships in the Columbia river, Puget Sound, and at sea off the North Atlantic Coast. Mr. Duel states that the station is the third to be commissioned on the Pacific Coast by the Federal Telegraph Company for exclusive use of ship messages. The call letters of the new station are "KEK". The Federal's other stations are at San Francisco and Los Angeles. Sea travel is daily being made safer by the more widespread use of radio.

* * *

J. M. Van Duzer, prominent in Portland shipping circles, has been appointed vice-president of the Blair Shipping Company, it is announced by W. D. Blair, president of the firm. The company has offices in San Francisco, Portland and Seattle and others will be opened at Los Angeles and Vancouver.



This is the Furness-Prince liner London Mariner which recently ran from San Francisco to Glasgow in 25 days, 21½ hours. Speed, boy, speed! Another steamer of the Furness-Prince Line, the London Merchant, made Vancouver from Cardiff in 29 days.

PACIFIC MARINE REVIEW'S THE MONTH IN MARINE INSURANCE

THE MONTH'S DEVELOPMENTS ON THE PACIFIC COAST

By FRANCIS ADRION

AS an aftermath of the general havoc wrought in Japan by the earthquake and fire, underwriters are now concerned with the inadequate facilities for handling cargoes at these ports. The destruction of Yokohama docking was so complete that the provisions for storing and handling cargoes here is of a very makeshift nature. This condition has, naturally enough, produced a very serious congestion of cargo.

A heavy loss will undoubtedly result both from exposure and from theft. This congested condition is augmented by reason of the fact that rail tansportation to the interior is slow and inadequate. Underwiters' representatives now in Japan have recommended that the warehouse to warehouse coverage usually granted be limited at destination to a fixed number of days after vessel's arrival. Further, that it should be stipulated in policies that no claim shall attach by reason of exposure of the interest insured to the elements. It is pointed out that if this risk of exposure and/or theft is included, an adequate additional premium should be obtained. Were it possible to do so, the underwriter would exclude entirely these risks, but this, unfortunately, he cannot do. Open policy clients demand protection and usually get it. It merely resolves itself into a question of premium and it is here that the underwriter is hard put. To name a rate for a risk such as the foregoing is guesswork pure and simple.

December Losses

The steam schooner Flavel, bound from Grays harbor to San Pedro, went aground December 13 off Carmel, subsequently becoming a total loss. The Flavel was owned and operated by the Hammond Lumber Company and was insured in the local market for $125,000.

On December 16 the steamer C. A. Smith, bound out from Coos Bay, struck the breakwater and likewise became a total loss. The C. A. Smith was owned by the Pacific States Lumber Company and was insured for $180,000, also in the local market.

Considering the weather conditions prevailing when this latter vessel attempted to put to sea, it is small wonder that she got into difficulties. How much better for all concerned had she remained inside until conditions were more favorable. There has been considerable discussion over this and similar past losses, and underwriters generally feel that owners would do well to modify their practice of sending vessels to sea in the face of adverse weather conditions.

Both the above vessels were laden with lumber, the Flavel having a capacity of 1,200,000 feet and the C. A. Smith 1,500,000 feet. It is interesting to note that neither of the cargoes were insured, it being the practice of both these owners to underwrite their own lumber. At the present low rate on coastwise lumber a loss such as these represents the premium on over 300 trips, and is quite a jolt for any private insurance fund.

Hard to Figure

It has often struck me as peculiar that bids for repairs by different yards should vary to such a great extent, and I offer the following as an example:

Tenders for repairs to steamer in collision:

A.	$14,900	19 days
B.	$10,490	12 days
C.	$ 4,360	12 days

I can hardly believe that conditions prevailing locally in the various yards as regards the work on hand, labor, etc., could account for any such difference as this. Furthermore, it is often the larger, better equipped yards who are the higher bidders which makes it still more mysterious.

If by chance some bright young shipyard worker should see this and would take the trouble to explain it to me, I would be more than grateful.

It is worthy of special notice that had C had an off day and a less sharp pencil, and produced thus a bid 100 per cent higher, he would still be the low bidder by a comfortable margin.

Policy Forms

With further reference to last month's comment on the varied "perils clauses" in common use: on November 22 a meeting of hull underwriters was held and the subject was gone into at some length.

As regards underwriting of the local wooden vessels coming within the scope of the Hull Agreement, it

was unanimously agreed that the "perils clause" should be uniform in all policies.

Accordingly, a suitable clause was approved at the meeting and copies of same were circulated for the guidance of the various companies. As a matter of fact, this clause is no innovation, but was incorporated in pro forma policy drawn up and circulated to members of the Steam Schooner Agreement in 1917.

The understanding is that this clause embraced the maximum amount of coverage to be given at scheduled rates. In a case of this kind the maximum is always the minimum as well and is worthy of particular note for this reason. By concerted action on a matter of common interest, underwriters can easily accomplish what, as individuals, would verge on the impossible. If this be a self-evident truth then —that much can be done in unison —are we not lax in its application? I am quite willing to plead guilty of being a bit of a bug on anything having a bearing on the regulation of marine rates or conditions. In fact, I consider this to be the ultimate salvation of all concerned. I do not of course hold to this theory to an extent impossible of application, but I do contend that certain classes of business readily amenable to regulation are ever so badly in need of just this.

Insurance Federation

On December 15, 1923, the Insurance Federation of California, through its president, J. B. Levison, issued to members a timely letter combining the season's greetings with an appeal for continued loyalty and support.

Mr. Levison's letter points to the splendid achievements of the Federation as regards the defeating of unfavorable legislation. He emphasizes the responsibility resting upon company men to create by fair and friendly dealing a continued public approval of company insurance as against state insurance.

The letter is reproduced here in part:

"In extending to you the customary greetings of the Christmas season I am influenced by more than a perfunctory performance of an official duty. The relation between myself as president and the officers and members of the Federation has been of the most pleasant nature, and the closing of accounts for the year 1923 brings only a sentiment of good fellowship toward all those who have aided in the success which we have been able to achieve.

"At the session of the State Legislature we assisted in defeating several proposed measures the enactment of which would have been harmful to every branch of insurance, and I wish to extend my congratulations on the results secured and at the same time to express my appreciation of the fine spirit of cooperation and loyalty of our membership everywhere manifest in maintaining the high standards of the Federation.

"But past success is of value only in proportion as it strengthens us for future contests. The responsibility presses upon us to cultivate among our friends and clients a friendly attitude toward the fair and equitable operations of insurance so that, in the event of injurious legislation being proposed, either in the initiative before the people or at the State Legislature, such measures will not have the support, but rather the opposition, of the public. Our enemies are constantly on the alert to enact legislation tending toward state insurance which necessitates unfailing watchfulness on our part to defeat."

Study Class

The last meeting of the fall term of the Marine Underwriters' Study Class was held on December 13, 1923. Classes were suspended during the holidays, the first 1924 meeting being scheduled for January 10. Five very successful meetings were held during the term just closed. The fourth meeting was handled by G. B. Oxford of the office of Louis Rosenthal, assisted by Mr. Mattekuhn. The fifth meeting was in charge of F. C. Huchinson of the Matthews & Livingston organization. His subject proved to be too much to finish at one sitting and was held over for completion at the next meeting.

Hull Values

The readjustment in hull values as a natural sequence of a return to normal times has apparently reached the "Stop, Look and Listen" stage. Values have been steadily reduced until a pre-war level has been reached, if not passed. It is not at all unusual for a vessel bearing in 1920 an insured value of, say, $200,000 to have been placed in 1923 at a value of half this amount.

One of the governing factors is,

of course, that there is an abundance of comparatively cheap tonnage obtainable and book values are accordingly depressed. It is no simple thing to satisfy the owner who is in the market for full protection, and yet wishes his costs kept to a minimum. The owner's natural inclination is to secure as low a value as possible for full form insurance. His idea is, of course, to have this take care of all P/A claims and he then places enough total loss insurance to protect himself in that contingency.

It has never been an easy matter to turn a hull account into a profit, and these greatly reduced values make it infinitely harder to accomplish. Take, for instance, the matter of franchise: the vessel above referred to had, we will say, in 1920 an equally divided valuation on hull and machinery. On this basis a claim would have had to amount to at least $3000 before same would be collectable from underwriters. As against this, under present conditions, claim would only have to amount to $1500. This matter of franchise is an all important one, for, after all, it is not, as a rule, the total losses which eat up hull profits. Rather it is the innumerable small claims which tend to produce the undesired effect.

If the cost of repairs were today reduced in keeping with these low values, the matter would not be so serious. This, however, is not the case. Repair bills are still greatly in advance of pre-war prices and the result as regards hull profits is obvious.

Marine Insurance on the Atlantic

CHARLES F. HOWELL, Contributing Editor

UNDERWRITING attention has to be directed at frequent intervals to pressing problems growing out of cases involving the principles underlying liability as regards transshipments and re-routing. Recently occasion arose for such consideration when strikes at Hamburg and Bremen necessitated several vessels discharging their cargoes at nearby ports and reforwarding the goods to destination. The steamer Yorck, after discharging part of its cargo at Bremen, was unable to proceed with the balance promptly and sailed away for New York with the goods still on board, instead of waiting until conditions permitted the discharge of the remainder. Serious doubt as to the status of their coverage arose in the minds of shippers whose merchandise was involved in these transshipments and overcarriages.

There is little question that goods which were discharged at nearby ports and reforwarded were held covered under the ordinary deviation clause in the policy, even though the deviation arose as a result of the strikes. While the clause excluding the risks of strikes and riots relieves the underwriters from liability for damage done by strikers it would not seem to terminate the marine insurance on goods which, by reason of strikes, are discharged at some other port and from there sent on to destination. The deviation clause does not restrict its cover to deviations which occur through marine perils, for, as is well known, such deviations are covered by the basic policy without reference to the deviation clause.

Something quite different, however, entered into the over-carriage of the cargo of the steamer Yorck. Where a vessel, after arriving at her port of destination brings part of her cargo back to the country from which she sailed, with the intention of delivering the cargo on her next trip, it is not a deviation that we have but rather a new voyage. Although the consequence of somewhat different circumstances, the case of the return of the steamer Poznan from Havana was not dissimilar from that of the Yorck. The return of the Yorck was ordered by the steamship company as a matter of expediency in order to facilitate the turn around of its vessel; and, while the transshipments of the other vessel were for a similar reason, yet the latter came within the scope of a deviation, while the former is of such a wide departure as to constitute a new voyage.

Most policies carry a clause that applies, and if the bill of lading issued by the steamer Yorck reserved the right to the carriers to retain cargo on board and subsequently carry it to port of destination the clause above referred to would seem to be sufficiently broad to cover the over-carriage. However, many of the clauses used by the underwriters to cover against all lib-

erties as per contract of affreightment are limited by the words "within the scope of the policy." Thus, if the policy covers only outward shipments the return voyage of the Yorck would not be covered.

That Alabama Ruling

Warning has been sent out to the membership of the Board of Underwriters of New York, by the officers of that body, calling attention to the probability of a revocation of license should the recent Alabama ruling be violated. Not long since, the insurance commissioner of that state made a ruling applying to fire, marine, casualty and miscellaneous insurance to the effect that premiums must be paid on or before the 15th of the second month following the issue or renewal of the policy, either in cash or by note, bearing not less than 6 per cent interest.

Following the Leader

From time to time criticism is heard in this country of a venerable practice that has obtained at Lloyd's since time immemorial but which is of doubtful advantage in improving public opinion of marine insurance. It is what is known as "following the slip leader." Brokers who seek to place difficult risks at Lloyd's are in the habit of securing, as leaders on their slips, the names of two or three of the more prominent underwriters, knowing well that such influence goes far in getting lesser underwriting lights into line for some of the insurance. It is an open secret that in numerous instances the brokers indicate on their slips a rate lower than the risk warrants and secure the initials of the leaders through side agreements that carry competitive advantages. This, of course, misleads those underwriters who have merely followed along after the eminent leaders, because the followers do not share in the leaders' secretly arranged advantages. This may be a practice that has the stamp of time, but it is certainly not one calculated to bring added luster to the profession.

Rules of Salvage

Compensation, or salvage, is due those persons through whose assistance a vessel or her cargo has been saved from impending peril by the sea or by other navigable waters. There are certain circumstances by which the courts are generally guided in determining the amount of the salvage to be awarded. Such circumstances are as follows: (1) the labor expended by the salvors in rendering the salvage service; (2) the promptitude, skill, and energy displayed in rendering the services and saving the property; (3) the value of the property employed by the salvors in rendering the service and the danger to which such property was exposed; (4) the salvor's risk incurred in securing the property from the impending peril; (5) the value of the saved property; (6) and the degree of danger from which the property was rescued.

It should also be noted that compensation as salvage is not regarded by the admiralty courts merely as pay, on the principle of a **quantum meruit,** or as a remuneration **pro opere et labore,** but as a reward for perilous service voluntarily rendered, and as an inducement to seamen and others to embark in such efforts for the saving of life and property.

England and Altered Hague Rules

There is increasing impatience among English underwriters and shippers over the protracted delay in getting legislative action on the Carriage of Goods by Sea Act. Underwriters want the bill of lading proposition settled as soon as possible because it directly affects their business. What they want is a bill that will clearly define what liabilities shipowners may not contract out of, and, by inference, the liabilities that would call for insurance protection. It is their contention that it is imperative that a uniform method of adjustment be arrived at, and their hope is that the finally revised Hague rules will serve this end and clear up so many misunderstandings. English shippers and underwriters, as well as many bankers and shipowners over there, are of opinion that the alterations agreed upon at the Belgian capital at the recent Hague rules conference are of a minor character and ought to be incorporated in the Act now under passage in Parliament. It is felt that as the conference has agreed upon the changes it is probable that all the countries represented will make their own laws to conform.

War Claims Against Germany

Ever since the ruling by the Mixed Claims Commission denying Americans the right to recover from Germany funds expended for war insurance premiums, additional interest attaches to the awaited decision on subrogated claims. These are understood to total $150,000,000, and are for losses occasioned during the war through submarine and mine activities against merchant ships. These losses the underwriters have long since paid, but they hold subrogation rights upon which they have hopes of realizing. An economic defense has been raised by the Germans on the ground that unless the underwriters actually lost money on their war risk business they are without right of recovery. They insist that rates were based on the possibility of high losses and that therefore the underwriters should depend solely on their premiums as the source of income. The American representatives before the commission maintained that the legality of the right to subrogation could not be questioned, citing many precedents and holdings, and fur-

PACIFIC MARINE REVIEW'S
MARINE INSURANCE DIRECTORY

ther insisting that it was sufficiently clear that loss had been sustained.

Profit in Cotton

Underwriters in the New York market have increased the war and strike rates on cotton shipments to Germany, on account of the political unrest in that country. The advance nearly doubles the previous quotations.

Taken by and with, this has been a prosperous cotton season for the underwriters. Losses have been moderate, and despite the decrease in rates, made early in the season, on the waterborne end of export cotton, there is a margin of profit. The rate reduction was but slight, amounting to $2\frac{1}{2}$ cents per cent on first class lines, 5 cents per cent on approved tramp steamers, and 15 cents per cent on coastwise lines.

Dealers state that cotton has been moving faster this season than in any of recent years, due in part to the heavy export demand and part to high prices. There is practically no congestion at any United States port. The loss experience has been good. There was but one fire during the fall; that was at Blytheville, Ark., early in October, when 2400 bales were badly damaged or destroyed, returning about $50,000 in salvage. The floods at Oklahoma City involved a loss of approximately $200,000. There have been several fires on lighters in New York harbor, causing a total loss of about 4000 bales of American cotton and 1000 bales of Peruvian, with good salvage returns. Something like 6600 bales are involved in the Japanese disaster, but precise figures are still unobtainable.

Safe Arrival Risks

The British market has a coverage that is little known in this country. They call it "safe arrival" insurance, and it is in lively demand in London, the newspapers there interpreting its activity as indicative of a revival in trade. In the opinion of British underwriters its demand is a certain sign that shipowners are sending their vessels away with confidence of a cargo for a return voyage.

These safe arrival risks, according to the "Post Magazine" of London, are total loss only policies, to a great extent, and are intended to protect the shipowner against loss through his vessel being unable to carry a cargo for which she had been chartered. They are in the nature of insurance on freight, etc., as excepted from the provisions of the disbursement clause, viewed from one point, although there is apparently no case in which this question has been raised, so far as can be ascertained. It would seem, however, that the shipowner, with his vessel definitely fixed to load cargo at a port, would suffer loss if she were lost on her way to that port, and, in the absence of insurance which protected him in another way, he certainly appears to have a definite interest to insure.

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Today, 28 plants and 44 warehouses supply this one universally used gas for both welding and cutting in convenient portable form. And 1924 will see further additions to Prest-O-Lite facilities.

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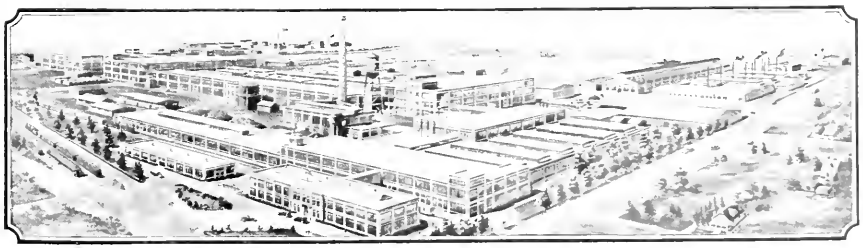


TWENTY YEARS AFTER

IN PACIFIC COAST SHIPYARDS

SHIP REPAIRING
SHIP BUILDING
RECONDITIONING
ENGINE REPAIRS

Current Shipbuilding

A contract for the construction of the first seagoing passenger steamer ever built at Los Angeles harbor was awarded the early part of December to the Los Angeles Shipbuilding & Drydock Corporation by the Wilmington Transportation Co.

This vessel is for Los Angeles Harbor-Santa Catalina Island run. She will have a capacity of 3000 passengers, will be 300 feet over all, 50-foot beam, powered with reciprocating engines and four boilers driving twin screws, and will have a speed of 18 knots.

The contract was awarded the Los Angeles company in competition with shipyards on both coasts, each yard submitting its own design and bid for the ship.

⁂ ⁂ ⁂

Work in Prospect

The Alaska Steamship Company, Seattle, Washington, is planning the construction of another steamship for the Alaska tourist trade, which will he a sistership to the steamship Alaska commissioned during the past season. Bids have been asked from shipyards on both coasts, but as one stipulation is that she shall be ready for service by June 1, 1924, it is probable that the contract will go to a Pacific Coast yard. The steamship Alaska was launched last April by the Todd Dry Dock & Construction Company of Tacoma.

⁂ ⁂ ⁂

The steamer Cadana, formerly the Sierra, purchased recently by the Oceanic Steamship Company from the New York Shipbuilding & Drydock Corporation, will be reconditioned at San Francisco for the Australian trade. The Cadana was built in 1900 at the Philadelphia yards of William Cramp & Sons for the Oceanic Steamship Company and is a sistership to the Ventura and Sonoma.

Shipyard News

The Crowley Launch and Towboat Company of San Francisco has started construction of four large barges at its Oakland yards. The barges will be 100 feet long, 100 feet wide and will be of about 600 tions capacity and will be used in transbay work.

The steamer Burnside, now at Seattle and which was offered for sale for scrapping by the United States Shipping Board in October, will be transferred to the War Department and will be used as a cable ship in laying the Alaska cable.

⁂ ⁂ ⁂

The Cary-Davis Tug & Barge Company of Seattle recently added to its fleet the diesel-engined towboat Douglas, purchased from the War Department. The Douglas formerly was used by the War Department as a mine-layer. The steam engine and auxiliary equipment of the boat were removed and a Bolinder engine of 400 horsepower was installed. The Markey Machinery Company of Seattle built and installed her electric-driven auxiliaries, which included a semi-diesel engine of 20 horsepower, a generator and a compressor.

⁂ ⁂ ⁂

The Bethlehem Shipbuilding Corporation of San Francisco on December 20 was awarded contract by the Alaska Navigation Company of Seattle for repairs to the steamship Buford, which received damages to her bow in a recent collision. The Buford is also being prepared to carry an excursion to the South Sea Islands, scheduled to sail from San Francisco February 9.

Bid submitted by Bethlehem Shipbuilding Corporation was for $12,727 and 12 days.

⁂ ⁂ ⁂

Todd Dry Docks, Inc., Seattle, has received orders for converting two steamships to ferryboats to carry automobiles and passengers on Puget Sound routes. One job is the converting of the steamer Sioux of the Puget Sound Navigation Company, which when completed will be 180 feet long, with a beam of 38 feet and capacity for fifty automobiles. The other conversion is the steamer Seattle, owned by the Navy Yard Route, which when completed will be 190 feet long, with a beam of 44 feet and carrying capacity for automobiles of about sixty. The two jobs will aggregate about $250,000.

⁂ ⁂ ⁂

The Los Angeles Shipbuilding & Drydock Corporation received con-

tract for the installation of new turbines and general reconditioning of the steamer City of Los Angeles, owned by the Los Angeles Steamship Company. Bids were submitted by Pacific Coast yards as follows:

Los Angeles Shipbuilding & Drydock Corporation, $635,638 and 174 days; Bethlehem Shipbuilding Corporation, $657,400 and 175 days; Todd Shipyards Corporation, $662,800 and 190 days; United Engineering Company, $691,500 and 210 days; Moore Dry Dock Company, $673,527 and 182 days.

* * *

New Construction

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT
Potrero Works

Purchasing Agent: O. W. Streett.

Submarines USN:

S-40, hull 145.

S-41, hull 146.

Alaska Standard, hull 5318, tank barge, Standard Oil Co. (Calif.); 210 LBP; 40 beam; 13-6 loaded draft; full diesel-electric drive; keel May 1/23; launched Oct6/23; **delivered Dec10/23.**

Hull 5319, steel barge, Shell Oil Co.; 140 LBP; 26 bolded beam; 14 molded depth; keel Jan1/24, est.

Hull 5320, sister to above; keel Jan1/24, est.

Alameda Works

Lebore, hull 5310, combination ore and coal carrier Ore Steamship Co; 571-6 LOA; 550-1 LBP; 72 molded beam; 44 molded depth; 32-4 loaded draft; 11½ loaded speed; 20,000 D WT; Curtis turbines with Falk reduction gears, 5000 SHP; 3 Scotch SE boilers, 17-6x12, each 4287 sq ft; oil burners; keel Nov29/22; launched June5/23; **delivered Dec15/23.**

HANLON DRYDOCK & SHIPBUILDING COMPANY, OAKLAND, CALIF.

Purchasing Agent: R. Barker.

Dan F. Hanlon, hull 89, steam schr. D. J. Hanlon; 2500 DWT; 1400 IHP engines; 2 B&W boilers.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION, SAN PEDRO, CALIF.

No name, passenger steamer, Wilmington Transp. Co.; 300 LOA; 50 beam; 18 knots speed; recip engs: 4 boilers.

NAVY YARD, PUGET SOUND

Medusa, repair ship for government; 460 LBP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turgine eng, 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan2/20; launched Apr16/23; deliver May15/24, est.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons disp; keel April11/21; delivery Apr1/24, est.

JAS. ROBERTSON SHIPYARD, ALAMEDA, CALIF.

Ferryboat, double-end side-wheeler, Richmond-San Rafael Ferry Co.; 172 LBP; 38 beam; 9 loaded draft; 12 knots speed; 700 IHP cross comp. engs; 2 dry back boilers, 9-2; **keel Dec10/23;** launch Apr21 24, est.; deliver May20/24, est.

W. F. STONE & SON SHIPBUILDING CO., OAKLAND, CALIF.

Olive, hull 51, yacht, for F. A. Hyde; 50 LBP; 14 beam; 6 loaded draft; deliver Jan1/24, est.

PRINCE RUPERT DRY DOCK & SHIPYARD, PRINCE RUPERT, B.C.

Two cruiser hulls, 60 ft. for Dominion Government Fisheries Service; deliver Dec15/23, est.

TODD DRYDOCK & CONSTRUCTION CORP., TACOMA

Cincinnati, hull 107, scout cruiser USN; sister to above; keel May15/20; launch May23 21; **delivered Dec 1/23.**

Six steel barges, U. S. Engineers, Portland; 120x34x7-6 feet.

No name, passenger and freight steamer, Southern Pacific Co.; 445 LOA; 57 beam; 25 loaded draft; 16 knots speed; 7000 DWT.

Repairs

BETHLEHEM SHIPBUILDING CORP., SAN FRANCISCO

Install Foamite system: President Harrison, President Hayes. Connect and furnish steam and lights: Anahuac. Make two deck winches: Coalinga. Piston repairs: J. A. Moffett, Col. E. L. Drake, Cathwood. Propeller repairs: Lubrico, S. C. T.

Dodd, R. J. Hanna, Kroonland, Benecia, Johanna Smith, Meton. Install air pump: Priscilla. Furnish and install one stern tube: West Montop. Water end for circulator: Rose City. Alterations: Dominion Miller, sub-chaser No. 298. One tailshaft and nut: Adm. Sebree. Engine repairs: Santa Gertrudis Strombus. Make and install donkey boiler and platform: F. A. Warner. Piping: Belridge. Install soot blowers: Wilhelmina. Hull repairs: District of Columbia, J. A. Bostwick, Montebello. Air and feed pump repairs: Nayarit. Windlass engine: S. B. Hunt. Engine, boiler and hull repairs: Los Alamos, Halo, Wm. Donovan, Warwick (also winch repair). Install new burning system: Virginian (also make shaft). Windlass repairs: Suricheo, Los Angeles. Pump repairs: Samoa, Steel Scientist. Furnish Weir feed pump: Ranenfjord. Hawse pipe: Santiam. One telemotor pinion shaft: Hulaco. Make pilot house: Lubrico. New pistons: Vancolite. Make and install H. P. piston ring: Wilhelmina. Thirty Hatch covers: Katrina Luckenbach. Make and install new feed water heater and alterations to fire and water lines: Lurline. Drydock, paint, miscellaneous repairs: West Montop, Richmond Erskine M. Phelps, San Patricio, Wm. F. Herrin, Missourian, Alaskan, Coahuila, Meton, Kroonland, Georgian, Mexico, Gold, F. H. Hillman, President Cleveland, China Arrow, Wilhelmina, Mazatlan, Casco, Matsonia, Melville Dollar, Everett, Guerrero, Pearl Shell. Miscellaneous repairs: Virginian, Rose City, Ohioan, Paul Shoup, Esther Buhne, Toscalosa, Adm. Fiske, Pennsylvanian, San Dastano, Finland, Tahiti, Maine, Brasford, Nebraskan, Californian, Wairuma, Kentuckian, H. W. Baxter, Missourian.

LOS ANGELES SHIPBUILDING & DRYDOCK CORP., SAN PEDRO, CAL.

Drydock, paint and sundry repairs: tug Fearless, stmrs. Yorba Linda, F. Q. Barstow, H. M. Story, John D. Rockefeller, Tatjana, M. F. Elliott, schr. Avalon, Albion, Asso, Oil lighter No. 6. Drydock and repairs: stmr. Avalon, tug David P. Fleming. Hull damage and engine repairs: West Canon. Engine, boiler and hull repairs: Liebre, Wm. G. Wardell, A. C. Bedford. Engine repairs: Boobyalla. Miscellaneous repairs: James McGee, Charles Pratt, Yale, Woodman, Harvard, Elcicuta, Sea Prince, Idaho, Steel Inventor, Invader, Casiana, El Cedro, Frank Lynch, Yankee Arrow.

MOORE DRY DOCK COMPANY, OAKLAND, CALIF.

Drydock, clean, paint, misc. repairs: Orowaiti, Alden Anderson, M. S. Borga, stmr. Salina, Tiverton, Mojave, M. S. Adrien Badin, Chihuahua, Ventura, Willpolo, ferryboat City of Seattle, Dauntless, barges Hawaiian, Californian, Crockett, fireboats D. T. Sullivan, David Scannell, stmrs. President Wilson, Frank H. Buck, Harold Dollar, Carriso, m.s. Natoma, tug Henry J. Biddle. Engine repairs: Chiapas, Colombia, La Merced. Engine, hull and deck repairs: Howick Hall, Wellesley, West Carmona. Alterations and repairs to hull: President Taft, President Cleveland. Deck repairs: Finland, Carolyn Frances. Drydock and sundry repairs: Alliance, Hulaco, Munrio (damage repairs). Condenser, boiler and tank repairs: Astral. Drydock, renew stern frame, misc. repairs: Cascade. Hull and rigging: City of Sydney. Drydock, engine and propeller: Admiral Schley. Repairs to steering engine: Chas. H. Cramp. Sundry repairs: Dauntless.

NAVY YARD, PUGET SOUND

Docking and misc. repairs: battleships Idaho, Nevada. Misc. repairs: Tennessee, Milwaukee, Zeilin. Repairs incidental to operation as district craft: Sotoyomo, Mahopac, Tatnuck, Iroquois, Pawtucket.

SPEDDEN SHIPBUILDING CO., BALTIMORE, MD.

Engine repairs: tug Storm King, lighthouse tenders No. 72, Arbutus. Drydock, paint and rudder: tug Port Covington, stmr. R. M. McLane. Boiler repairs: tugs Ashwaubemie, M. W. Hunt, J. H. Riehl. Drydock and repair: tugs Columbia, A. L. Walker. Misc. repairs: tug M. M. Davis, stmrs. Betterton, Schnectady, West Quechee, West Cherow, Edgehill.

TODD DRY DOCKS, INC., SEATTLE, WASH.

Oil burning parts furnished: m.s. Dollar, Alaska, Sidney Hauptman, San Nazario, Grace Dollar, Ruth Alexander, Steel Trader, Pennsylvanian. Drydock and damage repairs: Tejon. Docked for miscellaneous repairs: Santa Cruz, Jefferson, Alaska, tugs Triumph, Monitor, City of Tacoma. Docked for cleaning, painting, misc. repairs: Andrea F. Luckenbach, Cuprum. Misc. repairs: Hakushika, Redondo, Sierstad, Gothic Star, Edward Luckenbach, Willpolo, Kurdistan, Kitsap II, S. N. Castle, Pomona, President Jefferson, Nebraska, Fuji Maru, President Jackson, Alameda, Eldridge, ferryboat City of Bremerton, tug Triumph, barge No. 23, Petroleum II.

YARROWS, LIMITED, VANCOUVER, B. C.

Drydock and misc. repairs: Algerine, Polar Forcite, Matsqui, Cascade. Collision repairs: Princess Alice. Install motor generator: Patrician. Sundry minor repairs: Princess Adelaide, Tees, Princess Victoria, Newington, Estevan, Grainer, Quadra, tug Qualicum, Berens.

Atlantic, Gulf, Lakes and Rivers

AMERICAN BRIDGE COMPANY, PITTSBURGH, PENN.

Purchasing Agent: W. G. A. Millar.

Twenty coal barges, American Steel & Wire Co., Pittsburgh; 175 x26x11; 9 delivered.

Forty coal barges, Carnegie Steel Co.; 175 long by 26x11; 17 delivered.

Five coal barges, West Kentucky Coal Co.; 175 x 26 x 11 feet; deliver Jan 24, est.

Twenty coal barges, Carnegie Steel Co.; 175x26x11 feet; deliver spring 1924.

Nineteen barges, U. S. Engineers, Louisville, Ky.; 110x26x6-6; deliver July 24, est.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft; deliver 1924, est.

THE AMERICAN SHIP BUILDING CO., LORAIN, OHIO

W. H. Gerhauser, vice-president and director of purchases.

Greater Detroit, hull 785, paddle steamer Detroit & Cleveland Nav. Co.; 535 LBP; 98 beam; 16 loaded draft; 20 mi loaded speed; 3 cyl comp engs, 10,000 IHP; 6 SE and 3 DE Scotch boilers, 14x20; keel Feb 10 23; launched Sept14 23; deliver spring, 1924.

Greater Buffalo, hull 786; sister to above; keel May2 23; launched Oct 27 23.

No name, hull 788, bulk freighter, Ford Motor Co.; 590 LBP; 62 beam; 20 loaded draft; 13 loaded speed; 12,000 DWT; 3300 IHP; Doxford diesel engs.

BATH IRON WORKS, LTD., BATH, MAINE

Purchasing Agent: J. L. P. Burke.

Light vessel 107, hull 87, second-class light vessel US Dept of Commerce, 109-6 LBP, 30 beam, 14-4 loaded draft, 9½ speed; comp eng, 400 IHP; 2 Scotch boilers, 10-6 x 11-5; keel Apr14/22; launched Dec8/23; deliver Jan/24, est.

Light vessel 109, hull 90, Relief; sister to above; keel May 31/22; launched Aug16/23; delivered Nov 22 23.

Light vessel 110, hull 91, sister to above; keel Oct6/22; launched Nov 10 23; deliver Jan15/23, est.

Light vessel 111, hull 92, sister to above; hull only; keel Aug21/23; launch Dec31/23, est; deliver Feb /24, est.

No name, hull 96, yacht for Hugh T. Chisholm; 118-4 LBP; 18-6 beam;

5 loaded draft; 15 miles loaded speed; two 6-cyl gas engs, total 1HP 400; keel Dec1 23; deliver May 1/24, est.

BETHLEHEM SHIPBUILDING CORP., FORE RIVER PLANT, QUINCY, MASS.

Lexington, hull 1300, airplane-carrier U S N.

Raleigh, hull 1382, scout cruiser U S N; launch Oct25/22.

Massachusetts, hull 1400, battleship U S N; to be scrapped.

S-44, hull 1391, submarine U. S. N.

S-47, hull 1394, submarine U. S. N.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT, WILMINGTON, DEL.

Moby Dick, hull 3483, yacht, F. S. Fish; about 116 LBP; 24 beam, keel Mar29/23; launched June16/23.

Hull 3486, army barge, U.S. Army; keel Sept24 23.

Hull 3487, army barge, U. S. Army.

Hull 3488, quarter boat, U. S. Army; keel Sept24 23; launched Nov 27/23.

BETHLEHEM SHIPBLDG. CORP., SPARROWS POINT PLANT, SPARROWS POINT, MD.

Alexander Hamilton, hull 4217, passenger vessel Hudson River Day Line; 325 LBP; 76 beam over guards; 13-8 deep; 1 TE eng, inclined, 3500 HP; 2 single and 2 double ended boilers; keel Apr2 23; launched Oct 20/23.

Boston, hull 4218, passenger vessel Eastern Steamship Co.; 385 LBP; 72-6 beam; 23-9 moulded depth; twin screw turbine engs, 6400 HP; 6 Scotch boilers; keel Mar 13/23; launched Oct27 23.

New York, hull 4219, sister to above; keel Apr3 23; launch Nov 24 23, est.

One barge, Sanford & Brooks; keel July5 23.

CONSOLIDATED SHIPBUILDING CORPORATION, MORRIS HEIGHTS, N. Y.

No name, hull 2728, tender, C. K. Billings; 37x7-6; 25 mil; 185 HP Speedway engs.

Wampus, hull 2729, cruiser, John McGee; 46x10; 20 mi; 75 Hp Speedway engs.

No name, hull 2730, F. B.; Est. A. Duke; 34x8-6; 27 mi; 250 HP Fiat engines.

No name, hull 2734, E. F. Hutton; same as above.

Helena, hull 2735, C. E. F. McCann; same as above.

Ba-Ba, hull 2736, George Sloane; same as above.

No name, hull 2737, stock; same as above.

No name, hull 2738, Caleb Bragg; same as above.

No name, hull 2739, stock; same as above.

WigWag, hull 2744, D. cruiser, H. S. Borden; 62x10-6; speed 30 mi; two 300 HP Speedway engs.

No name, hull 2745, Pierre Barbey; 34x8-6; speed 24 mi; 200 HP Hall-Scott engs.

Hulls 2746-50, inc, stock; 34x8-6; hulls only.

No name, hull 2751, tender, stock; 16x4-9; 14 mi; 10-12 Univ eng.

Klahanee, hull 2752, tender, L. M. Wainwright; same as above.

No name, hull 2753, runab, stock; 35x7; speed 30 mi; 185 HP Speedway engs.

Cynthia, hull 2754, tender, M. B. Mills; 25x x3; 28 HP Speedway eng.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Purchasing Agent: Ed. C. Geehr.

Concord, hull 449, scout cruiser USN; keel Mar29/20; launch Dec 15 21; delivered Nov3 23.

Trenton, hull 501, scout cruiser USN; keel Apr18 20; launched Apr 16 24; 84.3 per cent comp Dec1 23.

Marblehead, hull 502, scout cruiser USN; keel Aug4 20; 74.5 per cent comp Dec1 23; launched Oct9 23.

Memphis, hull 503, scout cruiser USN; keel Oct4 20; 58.5 per cent comp Dec1 23.

DEFOE BOAT & MOTOR WORKS, BAY CITY, MICH.

No name, hull 61, yacht builder's account; sister to above; keel June 28 22; launched Aug6 23; delivery June 1/24, est.

Reomar III, hull 70, R. E. Olds, 100 LBP; 18-6 beam; 4 loaded draft; diesel eng, 250 IHP; keel Sept1 23; launched Nov15 23; deliver June 1/24, est.

Two steel car floats, Erie R. R.; 186 long; 34 beam; 8 depth; launch Apr12 24, est; deliver Apr15 24, est.

DRAVO CONTRACTING CO., PITTSBURGH, PA.

Hulls Nos. 264-272, inc, 9 steel barges, U. S. Engineers, 430 gross tons each.

Hulls Nos. 279-281 inc., 3 steel sand and gravel barges, builder's account; 135 gross tons.

Hulls 282-285 inc., 4 steel dump scows, builder's account.

Hulls 293-306 inc., 14 steel barges, Mississippi River Commission, Memphis; 430 gross tons each.

Hull 307, steel sand and gravel barge, builder's account, 135 gross tons.

Hull 314, steel oil barge, Mexican Petroleum Corp.; 760 gross tons.

Hulls 315-316, 2 steel oil barges, Mexican Petroleum Corp.; 230 gross tons each.

Hull 317, derrick boat, U. S. Engineers, Huntington, W. Va.; 100 gross tons.

Hull 318, steel hull for sand dredge; Mississippi River Com., Memphis; 78 gross tons.

Hulls 319-327, inc, 9 steel derrick boat hulls; 115 gross tons each; for U. S. Engineers, Louisville, Ky.

Hulls 328-329, 2 steel dump scows, U. S. Engineers, Chicago; 127 gross tons each.

Hulls 330-331, 2 steel sand and gravel barges, Empire Limestone Co., Buffalo.

DUBUQUE BOAT AND BOILER WORKS, DUBUQUE, IOWA

Hulls 70 to 74, inc., oil barges, U. S. Engineers, Rock Island; 100 LBP; 30 beam; 6 loaded draft.

Hulls 75-76, 2 oil barges, U. S. Engineers, Cincinnati; 100 LBP; 30 beam; 6 loaded draft.

Hull 77, hull for towboat, U. S. Engineers, Nashville; 80 LBP; 20 beam; 4-6 loaded draft.

FRASER, BRACE, LIMITED, THREE RIVERS, QUEBEC

John C. Howard, hull 20, Lake freighter George Hall Coal Co. of Canada; 250 LBP; 43 beam; 16-6 loaded draft; 12 loaded speed; 3270 short tons DWT; TE eng, 1400 IHP, 19x32x56-36 stroke; 2 Scotch marine boilers, 14-7 x 10-8, coal burning; keel Apr/22; launched May5/23.

GREAT LAKES ENGINEERING WORKS, RIVER ROUGE, MICHIGAN

Purchasing Agent: Chas. Short.

Hull 245, bulk freighter, Ford Motor Co.; 586 LBP; 62 beam; 20 loaded draft; 13 mi speed; 13,500 DWT; 3300 IHP Doxford engs; keel Nov26 23.

HOWARD SHIP YARDS & DOCK CO., JEFFERSONVILLE, IND.

Steel tow boat; 140 long; 32 beam; 6½ depth hold.

Two steel river boats, U. S. government.

MANITOWOC SHIPBUILDING CORP., MANITOWOC, WIS.

Pere Marquette 21, hull 209, car ferry, Pere Marquette Ry. Co.; 348 LBP; 56 beam; 16 loaded draft; 14 mi. loaded speed; 2 sets TE engs; 2750 total IHP; 4 Scotch boilers, 14x6x11; 18 lbs pres; keel Oct1 23; launch Jan15 24, est; deliver Mar 15 24, est.

Pere Marquette 22, hull 210, sister to above; deliver June1 24, est.

MARIETTA MANUFACTURING COMPANY, POINT PLEASANT, W. VA.

Sailor, hull 137, towboat, Jones & Laughlin Steel Corp.; 165 LBP; 36 beam; 7-6 depth; 105 gross tonnage; 16x32x8 ft Tandem comp engs, western river return tubular boilers; keel Oct1 23; launch Jan1 24, est; deliver Feb1 24, est.

No name, hull 138, sister to above.

MIDLAND BARGE COMPANY, MIDLAND, PA.

Louisville, hull 17, side wheel, Louisville & Cincinnati Packet Co., Cincinnati, O.; 285 LBP; 80 beam; 700 DWT; launched Dec 23.

Hull 32, maneuver boat hull, U. S. Engs., Huntington, W. Va.; 60 LBP; 26 beam; 83 DWT; keel Jan1 23,

est; launch Feb1/24, est; deliver Feb25/24, est.

Hull 33, derrick boat hull, U. S. Engrs., Mobile; 80 LBP; 34 beam; 105 DWT; keel Feb1/24, est; launch Mar1/24, est; deliver Mar15/24, est.

Hull 34, sand and gravel barge, E. T. Slider Co., New Albany, Ind.; 176 LBP; 50 beam; 400 DWT; keel Feb15/24, est; launch and deliver, Mar/24, est.

NASHVILLE BRIDGE COMPANY, NASHVILLE, TENN.

Purchasing Agent: Leo E. Wege.

No name, hull 59, barge U. S. government; 120 LBP; 37 beam; 6.5 loaded draft; keel July15/23; launched Nov5/23; **delivered Nov10/23.**

No name, hull 60, barge, U. S. government; 60 LBP; 23 beam; 4.5 loaded draft; keel July1/23; **launched Nov23/23; delivered Dec2/23.**

Hulls 62-64, barges for U. S. govt, 80 LBP; 26 beam; 4 loaded draft; keel Mar1/24, est; deliver May12/24, est.

No name, hull 65, dredge, W. T. Hardison & Co.; 110 LBP; 30 beam; 6 loaded draft; keel May 1/24, est; deliver June 1/24, est.

Hulls 66-71 inc, pontoons, U. S. Engineers, Cincinnati; 40 LOA; 12 beam; 3 loaded draft; keels May/24, est

No name, hull 72, deck barge, Cumberland Transportation Co.; 100 LBP; 20 beam; 5 loaded draft; deliver Jan/24, est.

No name, hull 73, open barge; sister to above.

No name, hull 74, deck barge sister to above.

No name, hull 75, open barge; sister to above.

NAVY YARD, BOSTON

Whitney, destroyer tender No. 4, U. S. Navy; 460 L.B.P.; 61 beam; 21 loaded draft; 16 knots loaded speed; 10,600 tons displ; 7000 S.H.P. geared Parsons turbines; 2 W.T. express type boilers; keel Apr23/21; launched Oct12/23; deliver 1924, est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY, NEWPORT NEWS

Purchasing Agent: James Plummer, 233 Broadway, New York City.

West Virginia, hull 211, battleship USN; 600 LBP; 97-3½ beam; 30-6 mean draft; 32,600 normal disp; 21 speed; GE turbo-elec drive, 28,900 SHP; 8 B&W WT boilers, oil, 41,768 sq ft plus 4168 superheat; keel Apr 12/20; launch Nov19/21; **delivered Dec1/23.**

No name, hull 273, oil tank barge, Standard Oil Co. (N. J.); 210 LBP; 38 beam; 16-6 depth; 9 loaded speed; capacity 11,000 barrels; McIntosh & Seymour diesel engines; 455 HP Westinghouse motor; keel Oct22/23; launch Dec 23, est; deliver Feb/24, est.

No name, hull 276, freight and passenger steamer, Old Dominion Steamship Co.; 375-6 LBP; 53 beam; 29-9 depth; speed 16 knots; 2100 DWT; Newport News-Curtis turbines, 4750 SHP; B&W boilers.

No name, hull 277, sister to above.

NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

Purchasing Agent: L. G. Buckwalter.

No name, hull 265, bulk oil stock; 419-3 LBP; 56-3 beam; 25-9¼ loaded draft; 10¾ loaded speed; 9870 DWT; 3 cyl TE engs, 300 SHP; 3 SE Scotch boilers, 15-10x11-4; keel Feb28*23.

Carabobo, hull 278, combn str Red D Line; 305 long by 48 by 22; 12½ speed; 2200 SHP; turbines with reduction gear; Scotch boilers; keel Feb9/23; launched Oct27/23.

Arthur N. Herron, hull 279, tug, American Dredging Co.; 100x23x12 ft; 500 BHP; Winton diesel engs; keel Sept1/23; **launched Nov26/23.**

Hulls 280-289, ten carfloats, Pennsylvania R. R. Co.; 250 ft long; two tracks; 3 delivered; 7 on ways.

Hull 290, self propelled oil barge for Standard Transp. Co.; 260x40x14 feet; two 350 BHP diesel engs.

Hull 291; sister to above.

Hull 292; sister to above.

THE PUSEY AND JONES COMPANY, WILMINGTON, DELAWARE

Vice-president and general manager: W. G. Coxe.

Ocean City, hull 1027, double screw steel ferryboat, fireproof, Delaware River Ferry Co.; 200 LBP; 55-6 beam; 16 moulded depth; 2 comp cyl engs; 2 cyl tube boilers; 14 miles loaded speed; keel Feb10/23; launched Aug23/23; **delivered Nov16/23.**

SPEDDEN SHIPBUILDING CO., BALTIMORE, MD.

Purchasing Agent, W. J. Collison.

Tug A, Hull 255, U. S. Engineers, Phila.; 50 LBP; 14-1½ beam; 5 loaded draft; 41 DW tons; 100 HP Mianus engs; launch Jan1/24, est.

Tug B, hull 256; sister to above; launch Jan15/24, est.

Tug C, hull 257; sister to above; launch Feb1/24, est.

Tug D, hull 258; sister to above; launch Feb15/24, est.

STATEN ISLAND SHIPBUILDING COMPANY, STATEN ISLAND, NEW YORK

Purchasing Agent: R. C. Miller.

No name, hull 749, steel diesel-electric tugboat, Penn. R. R. Co.; 105 LBP; 24 beam; 13.5 loaded draft.

No name, hull 750, steel diesel-electric tugboat, Atlantic Refining Co.; 94 LBP; 21 beam; 11.5 loaded draft.

No name, hull 751; sister to above.

No name, hull 752; sister to above.

SUN SHIPBUILDING COMPANY, CHESTER, PENN.

Purchasing Agent: H. W. Scott.

A. MacKenzie, hull 58, hopper dredge US Engrs; 245 LBP; 46 beam; 19-6 loaded draft; 10½ loaded speed; 2000 DWT; diesel-electric drive; keel Mar9/23; **launched Nov20/23;** deliver Jan20/24, est.

W. L. Marshall, hull 59, sister to above; keel Mar26/23; **launched Nov 20/23;** deliver Feb20/24, est.

Dan C. Kingman, hull 60, sister to above; keel June18/23; launch Jan 15/24, est.

Wm. T. Rossell, hull 61, sister to above; keel June 21/23; launch Jan 15/24, est.

Hull 72, oil barge, N. Y. Central R. R.; 144 LBP; 27 beam; 11-6 depth; 1100 DW tons; keel Oct1/23; **delivered Dec6/23.**

No name, hull 73, motor barge, Standard Transp. Co.; 260 LOA; 40 beam; 14 depth; 2 350 BHP diesel engines.

No name, hull 74; sister to above.

No name, hull 75; sister to above.

No name, hull 76; sister to above.

No name, hull 77; sister to above.

Hull 78, oil barge, Sun Oil Co.

Hull 79, oil barge, N. Y. Central R. R. Co.; 144 LBP; 27 beam; 11-6 depth; 1100 DWT.

THE TOLEDO SHIPBUILDING CO., TOLEDO, OHIO

Purchasing Agent: H. M. Ives.

William K. Field, hull 176, bulk freighter, The Reiss S. S. Co., Sheboygan, Wis.; 580 LBP; 60 beam; 20 loaded draft; 12½ loaded speed; 12,000 DWT; TE eng, 2500 IHP; 3 Scotch boilers, 14 ft; keel June2/23; launch Oct/23, est; deliver Nov/23, est.

THE CHARLES WARD ENGINEERING WORKS, CHARLESTON, WEST VIRGINIA

Purchasing Agent: E. T. Jones.

Greenbrier, hull 21, U. S. Lighthouse tender; 164-6 long by 32-6 by 5; two non-condensing HP engs, 15-inch diam cylinder, 84-inch stroke; 3 Mississippi River type boilers, 26 ft long, coal burning, natural draft; keel June26/23; **launched Nov13/23;** deliver Feb 24, est.

J. B. Battle, hull 28, 100-ft diesel-electric towboat, U. S. Engs., Mobile; keel Apr12/23; launched July 17/23; deliver Dec/23, est.

C. B. Harris, hull 31, 24-in pipe line dredge, U. S. Engrs., Cincinnati, O.; 175 long by 50 by 81; pumping engs 1000 BHP McIntosh & Seymour diesel; 2 aux 225 BHP McIntosh & Seymour engines; keel Sept20/23; launch Dec31/23, est; deliver Mar/24, est.

Tacoma, hull 32, steel hull, Cincinnati Pomeroy & Charleston Packet Co., Cincinnati, O.; 190 long by 37 by 6; keel Dec10/23, est.

Lookout, hull 33, towboat, U. S. Engineers, Nashville, Tenn.; 116 ft. long; 29 ft. beam; 5-6 depth; 2 surface condensing tandem comp. engs, 300 HP; 1 watertube boiler; coal burning; natural draft; keel Feb4/24, est.

Progress of Construction

Recent Contracts

Los Angeles Shipbuilding & Drydock Corp., passenger steamer for the Wilmington Transportation Co.; 300 feet long, 50 feet beam, will have carrying capacity of 3000 passengers (day steamer) and a speed of 18 knots.

James Robertson Shipyard, Alameda, Calif., double-end side-wheel ferryboat for the Richmond-San Rafael Ferry Co.; 172 feet long, 38 beam, 9 loaded draft.

Defoe Boat & Motor Works, Bay City, Mich., two steel carfloats for the Erie Railroad Co.; 186 feet long, 34 beam, 8 depth.

Dravo Contracting Co., Pittsburgh, two steel dump scows for U. S. Engineers, Chicago; two steel sand and gravel barges for the Empire Limestone Co., Buffalo.

Nashville Bridge Co., Nashville, Tenn., dredge for W. T. Hardison & Co., 110 feet long, 30 beam, 6 loaded draft; six pontoons for the U. S. Engineers, Cincinnati; four barges for the Cumberland Transportation Co., 100 feet long, 20 beam, 5 loaded draft.

Staten Island Shipbuilding Co., one steel diesel-electric tugboat for the Pennsylvania Railroad Co., 105 feet long, 24 beam, 13½ loaded draft; three steel diesel-electic tugboats for the Atlantic Refining Co., 94 feet long, 21 feet beam, 11½ feet loaded draft.

Sun Shipbuilding Co., Chester, Penn, one oil barge for the Sun Oil Co. and one oil barge for the New York Central Railroad, 144 feet long, 27 beam, 11 feet 6 inches depth, 1100 D. W. T.

Keel-Layings

Ferryboat, Jas. Robertson Shipyard, Alameda, Calif., for the Richmond-San Rafael Ferry Co., Dec. 10.

Yacht, Bath Iron Works, Ltd., Bath, Me., for Hugh T. Chisholm, Dec. 1.

Bulk freighter, diesel powered, Great Lakes Engineering Works, River Rouge, Mich., for the Ford Motor Co., Nov. 26.

Launchings

Light vessel 110, Bath Iron Works, Bath, Me., for the U. S. Dept. of Commerce, Nov. 10.

Quarter boat, Bethlehem Shipbuilding Corp., Wilmington, Del., for the U. S. Army, Nov. 27.

Reomar III, yacht, Defoe Boat & Motor Works, Bay City, Mich., for R. E. Olds, Nov. 15.

Arthur N. Herron, tugboat, New York Shipbuilding Corp., for American Dredging Co., Nov. 26.

A. MacKenzie and W. L. Marshall, hopper dredges, Sun Shipbuilding Co., for U. S. Engineers, Nov. 20.

Greenbrier, lighthouse tender, Chas. Ward Engineering Works, Nov. 13.

Deliveries

Alaska Standard, tank barge, Bethlehem Shipbuilding Corp., San Francisco, for Standard Oil Co. (Calif.), Dec. 10; Lebore, combination ore and coal carrier, for the Ore Steamship Co., Dec. 15.

Light Vessel 109, Bath Iron Works, to U. S. Dept. of Commerce, Nov. 22.

Concord, scout cruiser, Wm. Cramp & Sons Ship & Engine Building Co., to U. S. Navy, Nov. 3.

Two barges, Nashville Bridge Co., to U. S. Government, Nov. 10 and Dec. 2.

West Virginia, battleship, Newport News Shipbuilding & Drydock Co., to U. S. Navy, Dec. 1.

Ocean City, ferryboat, Pusey & Jones, to Delaware River Ferry Co., Nov. 16.

Rodman Wanamaker, ferryboat. Staten Island Shipbuilding Co., to City of New York, Nov. 14.

Oil barge, Sun Shipbuilding Co., to N. Y. Central R. R., Dec. 6.

Repair Award

The steamer Nanking is undergoing reconditioning at the Seattle plant of the Todd Dry Docks, Inc., for the Pacific Steamship Co., at a cost of $97,600. The vessel will be used in the coastwise service.

RATES AND CHARTERS REPORT

December 18, 1923.

OUR last report was dated November 19, at which time there was great activity in time chartering and also in trip charters for lumber cargoes to Japan. About the first of the month, however, lumber orders from Japan commenced to slow up with the result that freight rates dropped from $16 per thousand feet on full charters to $15, and vessels are now reported as offering at $14.50 to $14.75 without securing takers.

Following is a list of fixtures: British stmr. Somerton, two trips, $15.50 first trip and $15 second trip, by W. L. Comyn & Co.; British stmr. King Idwall, two trips, $59,000 first trip, $57,000 second trip, Canadian American Shipping Co.; German stmr. Ruth Kayser, lump sum $40,000; German stmr. Odin, Feb., $15.25, Percy S. Laing; unnamed stmr., $15, by Wilcox, Hayes Co.; Swedish stmr. Faxen, $15.50, Jan., W. L. Comyn & Co.; British stmr. Grelwen, $14.75, Dec., Dant & Russell; Dutch stmr. Aldebaran, $15.50, Jan., W. L. Comyn & Co.; British stmr. Scatwell, $15.50, Jan., Mitsui & Co.; British stmr. Argalia, $16, two trips, Jan.; an Andrew Weir steamer, lump sum, $53,000, Canadian American Trading Co.; British stmr. Queen Alexandria, lump sum $42,000, J. J. Moore & Co.; British stmr. Kilnsea, $15.50, H. R. MacMillan Export Co.; British stmr. Ethelfreda, Jan., $15 first trip, $14.75 second trip, A. M. Gillespie, Inc.; American stmr. Tyger, $15.50 first, $15 second, Dec., Pacific Export Lumber Co.; Dutch stmr. Tenbergen, lump sum $43,500 first trip, $42,500 second trip, Jan., A. M. Gillespie, Inc.; British stmr. Voreda, lump sum $78,500, Jan., Feb.; Norwegian stmr. Modesta, four round trips, rate not stated; German stmr. Anna Kayser, lump sum $40,000, Jan., Feb., J. J. Moore & Co.; Japanese stmr. Yehime Maru, $16, Feb., Robert Dollar Co.; Japanese stmr. Birma Maru, mechandise and lumber, terms private; American stmrs. Eastern Knight and Monticello, charterers and rates not stated; Norwegian stmr. Elida Clausen, Jan., Balfour, Guthrie & Co., terms private; Swedish stmr. Sagoland, Dec., Jan., terms private; Italian stmr. Carnia, lump sum $57,500, Jan., W. L. Comyn & Co.; British stmr. King Alfred, Canadian American Shipping Co.; stmr. Arnell, $15, Mar., Dodwell & Co.; British stmr. Ascot, $14.75; British stmr. Artemisia, $15, Dodwell & Co.; British stmr. Knockfierna, $15.50, Jan., Feb.; American stmr. Orinoco, $15.50, Dec.; British stmr. Saint Dunstan, Dec., Jan., terms private; British str. Tritonia, $15.50, Jan., Feb.; British stmr, Misty Law, Jan., Dant & Russell, terms private; British stmr. Chalister, American Trading Co., terms private; American stmr. Orient, $15, Feb.; Norwegian stmr. Arna, Dec., terms private.

The following list of steamers taken on time charters will be used principally in carrying lumber to Japan: British stmr. Rio Azul, three voyages, delivery Shanghai, Dec., redelivery Orient, $1.20 per deadweight ton per month; Danish stmr. Transvaal, four round trips trans-Pacific, delivery Puget Sound, Jan., Feb., 4/10½ per deadweight ton per month, A. M. Gillespie, Inc.; stmr. Raven Scar, 4 months, trans-Pacific, Feb., Yamashita & Co.; British stmr. Manchester Civilian, 8 months, rans-Pacific, Dec., Jan., same charterers; Norwegian stmr. Havo, 8 months, Feb., Mar., same charterers; Danish stmr. Bolivia, Feb., Mar., 8 to 9 months, same charteers; British stmr. Gambia River, 15 months, trans-Pacific, delivery San Francisco, Jan., same charterers; British stmr. Nuolja, 12 months trans-Pacific, delivery Pacific Coast, Feb.; British stmr. Brockdale, 12 months, option 14 months, delivery Pacific Coast, Jan., Feb., same charterers, all placed at a reported rate of 4 9; Norwegian stmr. August, 8 to 10 months, trans-Pacific, Jan., 4 10½, by W. L. Comyn & Co.; Japanese stmr. Kayo Maru, 6 months, trans-Pacific, delivery Pacific Coast, Jan., rates not stated; British stmr. Sheaf Mead, 4 trans-Pacific rounds, delivery Pacific Coast, Jan., redelivery Far East, 5 1½, A. M. Gillespie, Inc.; Norwegian stmr. Loch Tay, 9 months, delivery Pacific Coast, Jan., 5 3, W. L. Comyn & Co.

The activity continues in full cargo shipments of grain from the North Pacific to the United Kingdom and Continent, as also to the Orient, and the following charters are reported: British stmr. Peterton, to the United Kingdom, 37 3, Feb.; British stmr. Afganistan, to Antwerp, 36 6; Japanese stmr. Venice Maru, to the United Kingdom, Suzuki & Co., terms private; British stmr. Bradclyde, United Kingdom, 37 6, Mar., Louis Dreyfus Co.; British stmr. Levenpool, to the United Kingdom or Continent, Jan., 37 6; British stmr. Carnarvonshire, Antwerp, Rotterdam, 35 6, Jan., Feb.; British stmr. Tiverton, United Kingdom, 37 6, Jan.; British stmr. Persian Prince, United Kingdom or Continent, 37/6, Jan.; Spanish stmr. Artagan Mendi, United Kingdom or Continent, Jan., terms private. Strauss & Co.; Italian stmr. Carso, United Kingdom or Continent, Dec., James Richardson & Sons; Japanese steamer Rhine Maru, Dec., Continental Grain Co., terms private; Japanese stmr. Denmark Maru, Dec., Kerr, Gifford & Co., terms private; British stmr. Mary Horlock, North Pacific to Shanghai, $6.75 per ton of 2000 pounds, Jan., Feb.; Dutch stmr. Manoeran, Shanghai, $6.50, Feb., Mar., Balfour, Guthrie & Co.; Dutch stmr. Tjikandi, Japan, $6, option Shanghai $6.50, Suzuki & Co.; British stmr. Benmacahui, Japan, $6.25, option Shanghai $6.50, two trips; British stmr. Keranton, for Shanghai by Globe Grain Co., Feb., terms private; Dutch stmr. Tenbergen, Orient, Mitsui & Co., terms private; Swedish stmr. Lahonia, Shanghai, $6.75, option Japan $6.50, Jan.; Norwegian stmr. Leikanger, Japan, $6.50, Jan., Strauss & Co.; British stmr. Shelley, Japan, $6.50, Mitsui & Co.; Swedish stmr. Strassa, Japan, $6.50, option Shanghai or Dairen $6.75, Suzuki & Co.; Japanese stmr. Belfast Maru, Orient, Dec., by Strauss & Co., terms private; Japanese stmr. Goshu Maru, Orient, James Richardson & Sons, Dec., terms private; Japanese stmr. Seine Maru, Orient, Dec., by James Richardson & Sons, terms private.

British tanker Scottish Castle reported for crude oil from Pacific Coast to United Kingdom, Dec., terms private; American tanker District of Columbia, for crude oil from the Pacific Coast to North Hatteras, 67c per barel, option of distillate at 65c per barrel; tanker Bethelridge, Pacific Coast to Atlantic for crude petroleum, 68c per barrel, Dec.

There are no inquiries for tonnage to Australia or to the West Coast of South America. A steamer asking for bids for a full lumber cargo from the North Pacific to the Atlantic seaboard north of Hatteras could not get better offers than $11 per thousand feet. Chartering in all other directions from the Pacific Coast remains exceedingly quiet.

PAGE BROTHERS, Brokers.

SODERBERG ELECTRODES

THE electrode may properly be called the "heart of the electric furnace."

The growth of the electric furnace industry has been dependent on the ability of furnaces users to secure electrodes of proper size and quality. The high quality of the present baked electrode is a credit to the manufacturer and can only be fully appreciated by the user whose experience includes the numerous troubles experienced in the early days of the industry.

The special raw materials and expert supervision necessary to produce carbon or graphite electrodes of uniform, excellent quality justify the high price demanded for this product.

The Soderberg Idea

The Soderberg idea dispenses entirely with the use of previously baked electrodes and their replacement or introduction into the furnace. The necessity for an expensive manufacturing process is thereby eliminated.

The Soderberg electrode is a continuous electrode, made, baked and consumed in the same furnace. A raw mix of carbonaceous material is tamped into a ribbed cylinder of light gauge metal, thus forming the electrode. The baking process is accomplished by the waste heat. As the electrode is consumed, it is lowered into the furnace and new sections of casing are added at the top as required.

It will be at once evident that the limitation heretofore existing as to the size of single electrodes has been removed by the Soderberg method.

Large Sizes Possible

Soderberg electrodes, forty inches in diameter, are in regular successful operation in Europe and large rectangular sections are also in use. Enough experiment has been done to prove that electrodes 100 inches in diameter are entirely practicable. Special shapes, hollow electrodes of large diameter, electrodes with central water-cooling are feasible.

Economic Advantages

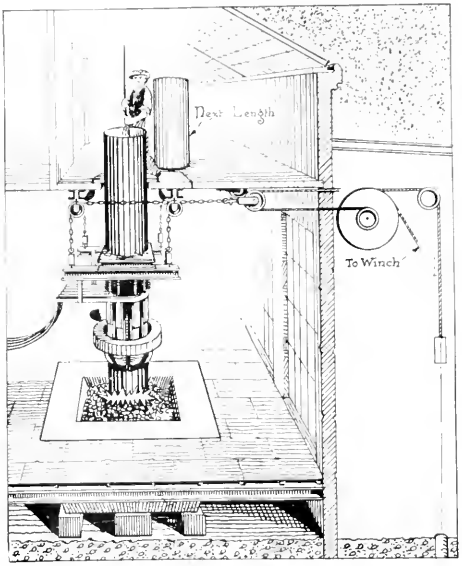
But the Soderberg electrode also promises substantial and immediate economies to present furnace users, because it means lower first costs, reduced consumption and continuous operation.

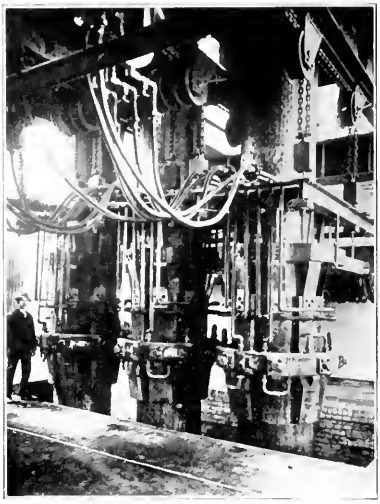
As the cost of the raw material and casing in place is only about 60 per cent that of the standard carbon electrodes, there is at once a substantial saving in first cost.

An important reduction is made in the amount of electrode consumed per ton of product, due to protection against exidation afforded by the sheet iron casing. "Spindling" and "wasping" are entirely prevented.

Furthermore, breakages are unknown with the Soderberg method, and there are no waste ends, broken electrodes or "butts" to be discarded. No time is lost in changing electrodes and absolute continuity of furnace operation with the resultant improved operating costs is attained.

The Electric Furnace Construction Company of Philadelphia is the sole representative in the United States and South America for Det norske Aktieselskab for Electrokemish Industrie, Christiania, Norway, owners of the Soderberg patents. The method of manufacturing electrodes as described is fully covered by general and detail patents in all the principal countries of the world.





At left—Diagrammatic sketch showing Soderberg electrode fitted in open hearth furnace. Above—6000 kilowatt carbide furnace with three 40-inch Soderberg electrodes.

SALINITY METERS

Equipment for the Measurement of Electrolytic Conductivity as Developed by the Brown Instrument Company of Philadelphia

THE method of detecting and measuring changes of the concentration of salts, acids, alkalies or other materials entering into solution by changes of electrolytic conductivity is old and well known. Usually two electrodes are immersed in the solution to be tested and the electrical resistance to current flow measured.

Of the many methods for measuring or indicating changes of resistance, perhaps the oldest is the method of connecting a lamp in series with the electrodes on a 110 volt circuit. It is evident that the brilliancy of the lamp will then depend upon the concentration of the solution around the electrodes. Other methods make use of a meter in series with the electrodes, or a relay device arranged to operate a bell or lamp when the concentration reaches the predetermined value. For more accurate measurements the null or Wheatstone Bridge method is preferable.

Lamp Type Salinity Detector

Of all these methods the lamp system appeals to one because of simplicity and low cost. There are, however, several serious disadvantages to the method. The brilliancy of the lamp for any given salt concentration existing around the electrodes varies with the line voltage. Then, too, the personal equation will enter greatly into the ability of various observers to interpret the lamp brilliancy in terms of salt concentration.

A new instrument has been developed to eliminate these difficulties. The supply circuit feeds two parallel paths, in each of which is connected a lamp. Both lamps are exactly alike in characteristics. The cell or electrodes are connected in series with one lamp while the second lamp is connected in series with a variable resistance. It will be readily understood that if this resistance is adjusted so as to be equal to the resistance between the cell electrodes for a given concentration of salt in the water, the lamps will burn with equal brilliancy and be affected alike by line voltage. Consequently the observer's eye is provided with a standard for comparison, thus eliminating the personal equation and errors due to voltage variations.

Another desirable feature incorporated in the lamp is the provision for automatic temperature compensation. The electrodes are so arranged as to move further apart as the temperature increases, thus producing an increase of resistance to balance the decrease due to the rise in temperature. Similarly a decrease in temperature results in a movement of electrodes toward each other, thus producing a correction in the reverse direction. This movement is produced by the expansion of dissimilar metals.

The equipment may be furnished for continuous operation or for intermittent test of boiler and feed water samples. A removable brass cup, fitted with a drain cock, is supplied. The water to be tested may be poured into this cup and then drained for further tests. The switch and lamps are well protected from breakage and all parts are substantial. The electrodes are heavily plated to avoid excessive corrosion. The low cost and great simplicity of this salinity detector makes it suitable for service under conditions that more complicated salinity systems will not meet.

Induction Type Salinity Indicator

The principle of operation is similar to that of the watthour meter. A light aluminum disc running in jewel bearings is rotated between laminated magnetic pole pieces by the eddy currents generated in the disc. The torque in one direction is controlled by the current flow through the water surrounding the electrodes. Consequently it depends upon salinity of the water under test. The torque in the other direction is fixed and depends upon the current flow through a resistance. This resistance is so adjusted as to be equivalent to the resistance between electrodes at a definite salinity. Then, if the salinity of the water under test exceeds this predetermined value the disc will rotate and close a contact in the alarm or signal light circuit. If the salinity should be lower than the predetermined value the torque controlled by the fixed resistance will predominate and the meter disc will rotate in the opposite direction.

Automatic temperature compensation is secured by varying the resistance in response to temperature changes. The instrument is practically free from voltage and frequency errors in that the circuit is differential. Vibration has very little effect on the meter because of the absence of fragile suspensions. The moderate accuracy, ruggedness add low cost make this instrument particularly suitable for marine service. Its construction renders it practically moisture-proof. The compact form is also of advantage for installations under conditions where very little space is available. Alternating current is necessary for operation of this meter. For plants having only direct current a neat rotary converter and a transformer can be supplied.

Electrodes should be frequently cleaned and the removable electrode platinized. The latter operation can be completed in a few moments with a platinizing unit designed for the purpose.

These salinity indicators have a large and very useful field in applied chemistry, but their principal interest lies in the application to steam generating plants as a check on the corrosive qualities of feed water.

AMDYCO—A NEW PRODUCT

THE American Dyewood Company of New York announces the development of Amdyco, a new stabilizer for foam type extinguishing systems. The product was formally approved by the Underwriters' Laboratories, Inc., November 21, 1923.

Amdyco is the result of experiments which have been carried on by the company's chemists for some time. In perfecting it the American Dyewood Company has cooperated closely with the large oil companies of the East and Middle West.

Extensive tests conducted by the Underwriters' Laboratories, Inc., on all types of oil fires seem to have amply proved the superiority of Amdyco over similar products. Greater persistency, increased volume of expansion, and a much easier flow is reported for the foam blanket formed by this new product.

No indications of decomposition were found by the Laboratories.

The results realized from these tests and also from tests conducted by some of the large oil companies have won for Amdyco the endorsement of several of the largest manufacturers of hand and portable extinguishing apparatus. Well known foam installation engineers are already specifying it for installations.

A New Principle in Flexible Couplings

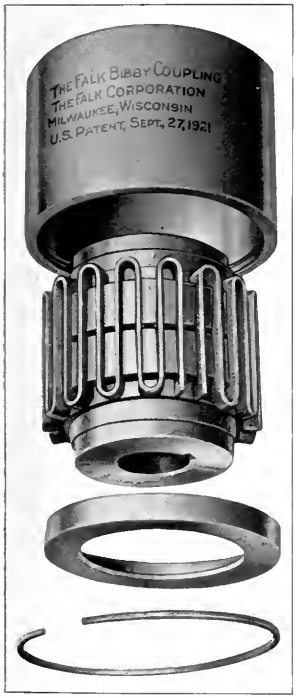
THE Falk-Bibby flexible coupling, exhibited for the first time at the American Mining Congress, Milwaukee, introduces a new principle into this class of equipment.

The Falk-Bibby coupling transmits power between two flanges by means of specially constructed grid springs of tempered steel. True flexibility is obtained from the elastic properties of these springs. The coupling is capable of withstanding an unusual degree of parallel and angular misalignment of the shafts.

The special feature of this coupling, however, is its torsional resiliency and consequent shock absorbing properties obtained from the action of the springs which engage with specially constructed grooves around the periphery of the flanges. These grooves fit the springs at the ends farthest apart but flare towards each other. Under a light load each bar or element of the spring is flexed between points which are separated by the maximum distance. The flexibility of the spring under these conditions is proportioned accordingly. As the load increases the springs wrap themselves around the walls of the inwardly flaring grooves which are especially curved for the purpose, so that increasing load shortens the effective span of each spring bar, causing it to offer greater resistance to flection without increase of stress. This produces torsional flexibility with increasing resistance to increasing torque and gives the coupling great power to cushion heavy shocks and to damp out torsional oscillations.

The working parts of the coupling are enclosed in a floating shell which is packed with lubricant.

The Falk-Bibby coupling is manufactured under the Bibby patents by the Falk Corporation of Milwaukee, which corporation has acquired exclusive manufacturing rights for the United States.



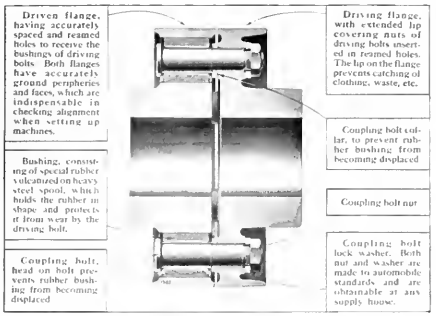
The Falk-Bibby Flexible Coupling

AIR SEPARATOR EFFECTIVE

THE Western Engineering Company, patentees and manufacturers of the Hickman air separator, report the installation of six-inch separators on the Shipping Board liners President Wilson and President Lincoln, operated by the Pacific Mail Steamship Company, San Francisco, and have booked orders during the month for a number of various sizes, including a four-inch for the Ore Steamship Company's vessel Lebore, just completed by the Union Plant, Bethlehem Shipbuilding Corporation. This device, which is placed in the main feed line between the feed water heater and boilers, has proved very effective in removing entrained air from feed water. Many interesting observations have been made on the performance of the Hickman air separators in actual operation. The case of the steamship Maui indicates that an average of 100 cubic inches of air per hour was being removed. The owners of the Maui, having noticed a material reduction in boiler maintenance, have outfitted their entire fleet of fifteen vessels with Hickman air separators in the effort to combat corrosion.

The Hickman air separator is a simple mechanical device with no moving parts, action of which was fully described in the December issue of Pacific Marine Review and represents so small an initial investment compared with benefits to be gained that a separator should be made an integral part of every steam boiler installation. Over 90,000 horsepower in boiler capacity is being protected by Hickman air separators, including such well known vessels as the Southern Cross, Matsonia, Wilhelmina, ferryboat Hayward, and many others.

The Western Engineering Company has moved its offices to the new Matson building, San Francisco, and is appointing representatives in all principal cities to better serve steamship owners and operators of steam boiler plants.



The De Laval Flexible Coupling

DE LAVAL FLEXIBLE COUPLING

THE De Laval flexible coupling is ideally suited to all services except those involving very high speeds. At such speeds centrifugal force acting on the rubber bushings results in an objectionable degree of compression. The coupling also should not be subjected to oil, or oil vapor, as oil causes rubber to deteriorate.

The De Laval coupling requires neither lubrication nor attention. Lubrication of a flexible coupling is always inconvenient and difficult and a coupling that requires no lubrication or attention is therefore best. As the coupling requires no lubrication, it will not "gum up" with grease and dust, which so often destroys the flexibility and shortens the life of other couplings.

The De Laval flexible coupling permits one shaft to be disconnected from the other without raising or disturbing either shaft. Upon taking off the nuts which hold the pins in place and driving out the pins, the shafts are completely freed from one another and either shaft can be lifted vertically without disturbing the other. This is essential, since it is never convenient to move a shaft axially in order to disconnect the coupling and never desirable to have to raise both shafts in order to free one of them.

Most flexible couplings involve the rubbing of metal surfaces or the bending of metallic elements. If there is rubbing, copious lubrication is essential, and repeated bending of metal parts often causes failure. A flexible coupling, to be truly flexible, must contain a flexible medium, one which will compress and expand without friction and without wear. The medium that does this most successfully is pure rubber, which is ideally adapted for the purpose. Not only does the rubber serve as a flexible medium to take care of misalignment, but it also serves to deaden shocks that may be generated by the driving or by the driven machines. Furthermore, the rubber bushings serve as insulators, which is sometimes desirable in electrical work.

When metallic couplings become worn the replacement of parts is difficult and expensive. On the other hand, the rubber bushings of the De Laval coupling can be cheaply and quickly replaced, and these are the only parts which become worn or damaged by abuse or excessive misalignment.

Pacific Marine Review

FEBRUARY, 1924

Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION
OF THE PACIFIC COAST

Pacific Marine Review, Vol. 21, No. 2. Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. $2.00 a year.

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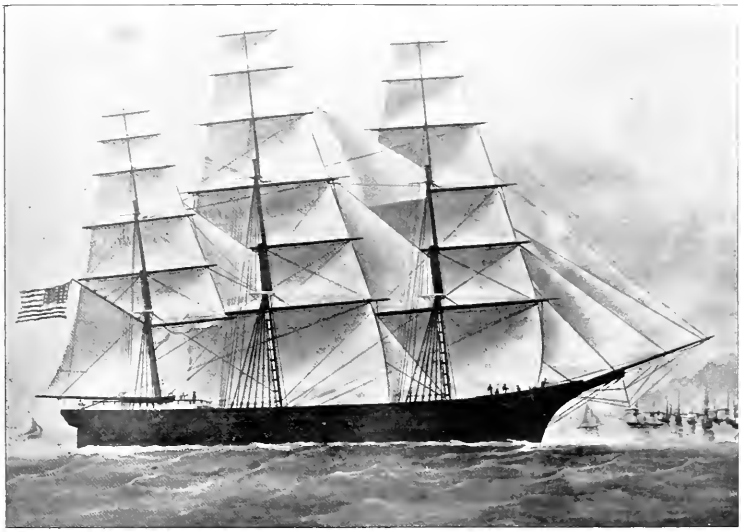
FEBRUARY, 1924



AMERICAN CLIPPER WILD HUNTER

The Wild Hunter was a fine clipper ship built at East Dennis, Massachusetts, for Christopher Hall, and was launched towards the end of 1855. Dimensions: 178 7 by 36:3 by 22 6, 1081 tons, old measurement, 1000 tons, new. She is described as a fine looking ship, capable of good speed but available records do not show any notable performances. She made four passages from eastern ports to San Francisco, her fastest being on her maiden voyage, 112 days from Boston. From San Francisco she was 85 days to Calcutta and reached Boston January 8 1857, being some two weeks over a year on the round voyage.

In March, 1866, was sold at Boston for $33,000. in the middle 70's her rig was altered to that of a bark, her name was dropped from the Register in 1883, but particulars of her final end are not at present available.

Vol. XXI FEBRUARY, 1924 No. 2

Pacific Marine Review

THE NATIONAL MAGAZINE OF SHIPPING
576 Sacramento Street, San Francisco
339 AT 30 CHURCH STREET, NEW YORK

J. S. HINES, Publisher
A. J. DICKIE, Editor
PAUL FAULKNER, Publicity Manager
BERNARD N. De ROCHIE, Business Manager

Official Organ of the Pacific American Steamship Association and the Shipowners' Association of the Pacific Coast.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879.

Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 20th.
Subscription price, a year (domestic).....$2.00
(foreign)..... 3.00
Single copies ..... .25

THE FUTURE OF THE UNITED STATES MERCHANT MARINE—I.

By A. C. HOLZAPFEL

THE principal condition to firmly establish the United States merchant marine is to find profitable employment for American merchant ships. More than half of these are at present lying idle in various ports. There is, therefore, a very serious task confronting us to get this fleet profitably employed. The building of new tonnage, except such as may be needed for special trades, need not be considered for the present. Before considering this question in detail, however, we must consider the broad outlines of the problem.

Necessity for Increased Efficiency and Subsidy

We have, in the first place, to reckon with the higher expense for wages and victualing of American ships. This expense is likely to face the American shipowner either permanently or at least for several decades, because it is hardly to be expected that other nations will within a visible distance of time reach the state of prosperity which this country is now enjoying and which causes a much higher level of circulation than is obtained in other countries. The disability under which the American shipowner has to work in this respect can be compensated for in two ways: firstly, in increased efficiency; secondly, by direct or indirect support from the government. The second proposition has for the present been shelved, although I feel perfectly satisfied that before many years have passed some laws will be on the statute books enabling the American shipowner to get some support from the government, either by a reduction of import duties on cargoes carried in American vessels, or by a direct subsidy. Before leaving this subject, I might perhaps make some remark on the fact that the subsidy bill was not carried through.

It has lately become quite evident to me that any legislation in this country has to be backed up by strong and well organized private or political interests. In this way, the La Follette Seamen's Act became law through the political influence of the Labor Party. The immigration laws were similarly enacted, while financial interests were the active force in the passing of such laws as the Esch-Cummings Railroad Bill, the Fordney Tariff and many others. It therefore seem that if shipowners want to get support from the government they should not rely on the patriotism of the people or of politicians, nor on the fact that a powerful merchant marine is a necessary adjunct to our navy, but we should simply rely on organization and financial backing, sufficiently powerful to arrange with legislators on the principle of "you scratch my back and I scratch yours" to carry such a measure through.

Till this has been accomplished we shall have to inquire whether through increased efficiency the handicap of American vessels as compared with those of other nations can be overcome. To this question I think I can reply in the affirmative, at least for a decade or two.

In the first place and in all circumstances the law which taxes repairs in foreign ports should be repealed. No other nation imposes such a tax on shipping, and the legislature in this connection has been stupidly neglectful and inconsistent in enacting this law and refusing the subsidy.

In considering the reconditioning of the 800 or more fine and almost new cargo vessels now lying idle in our ports, we have a task which should be solved on a distinctly American principle—that is, on the comprehensive lines of standardization—which, in spite of the handicap of high wages, have made American industry supreme in so many fields. This principle is the more applicable to the laid-up fleet, as these vessels have also been built mostly on principles of standardization and may be roughly divided into three classes:

First: Vessels of the Lake type, 3000-4000 tons deadweight, and needing about 1000 shaft horsepower.

Second: Vessels 8000-9000 tons deadweight, needing about 2000 shaft horsepower.

Third: Vessels about 11,000 tons deadweight, needing about 3000 shaft horsepower.

Diesel-Electric Drive

It has been universally recognized that the diesel-engined ship is so much more economical than other vessels that it is bound in the long run to displace the steam-driven vessels which now ply on the ocean. The diesel engine, however, is, comparatively speaking, in its infancy. Hitherto it has chiefly been used in the direct acting form, for which purpose it has to be a very heavy, slow running engine, and it also has to be reversible. This type of engine has the disadvantage of being very costly and of running considerably faster than is consistent with the highest propeller efficiency, which, in cargo vessels such as are now laid up, lies between 60 and 80 revolutions per minute.

However, several vessels have been and are being fitted up with electric drive. This is a non-reversible, fairly high speed diesel engine generating electricity, which is then applied to the propeller shaft at the most economical ratio and by means of which also the reversing is accomplished. Technically speaking, this arrangement is superior to the direct drive, because it gives a much more complete control for maneuvering. But there is a loss of 15 or 16 per cent in

transmission and the weight and expense of the electric drive are very considerable. For instance, a well-known electrical manufacturing company has given me the following estimate, adaptable to one of the Lake-type vessels:

Two prime movers (non-reversible diesel engines), 300 revolutions and 600 horsepower each, would give together 1000 shaft horsepower with electric transmission. The cost of electric transmission plant would be $45,000, the weight 62½ tons. These are staggering figures and can be very considerably improved upon from every point of view by hydraulic transmission, which I propose to describe in some detail.

Hydraulic Transmission

Hydraulic transmission was originally patented by Professor Foettinger in 1908 or 1909. The professor, a comparatively young man, whose name is also known in connection with the work on the torsional strain on shafting, was at that time in the employ of the Vulcan Shipbuilding Company of Stettin. About 1909 he described his hydraulic transformer in a paper before the German Society of Naval Architects at Charlottenburg.

The transformer consists of a centrifugal pump attached to the driving shaft of the prime mover and delivering water or other liquid to a forward turbine and the reversing turbine, which are both attached to the propeller shaft. The delivery of this water is regulated by a valve and lever; when the lever stands in the center the water from the centrifugal pump passes through a by-pass. According to how the lever is then moved, to the right or left, it passes to the forward turbine or the reversing turbine. The amount of water or water pressure so delivered can be so exactly regulated as to give one revolution, or even half a revolution, either way. The transformer, of course, constitutes an elastic cushion between the prime mover and the propeller, and racing is entirely avoided. Information just received from the Vulcan Company in Hamburg indicates that oil is now proposed instead of water as a medium or impelling liquid; also that a mechanical reduction may be combined within the apparatus.

The loss of power on a non-reversible diesel engine running 300 revolutions and giving a propeller speed of 60 to 75 revolutions per minute, would be 8 to 10 per cent, or approximately half that of the electric drive. The estimated cost of a hydraulic transformer delivering 1000 horsepower to the propeller shaft would probably be $10,000 to $15,000, if manufactured on a large scale; therefore, less than one-third that of electric drive. The weight of such a transformer would be under 30 tons, or less than half that of the electric drive.

I estimate, firstly, that the first cost of a non-reversible diesel engine, running 300 to 350 revolutions, together with a hydraulic transformer delivering power to the propeller shaft at 60 to 80 revolutions, would be substantially less than the first cost of a direct acting reversible diesel engine; secondly, that the combined weight of the non-reversible diesel engine and the hydraulic transformer would be slightly less than that of a reversible, slow speed diesel engine; thirdly, that the loss of power of the hydraulic transformer would be compensated for by increased propeller efficiency; lastly, that for maneuvering and for absence of racing this combination gives a decided advantage over the direct drive. But the principal advantage is this: that this combination lends itself particularly to standardized production on a large scale, and that this is exactly what is needed in connection with the problem of setting the 800 or 1000 comparatively new vessels to work, which were built during the war and which are now rusting away.

It is, however, a problem which cannot be accomplished by a single firm or a single person, but should be taken up by the Shipping Board, because the Shipping Board alone, through the public exchequer, can dispose of the very large sum required to carry out this program. If, however, the vessels now laid up were refitted in the manner here advocated they could be readily sold to private operators, and however much credit the government had to give in connection with such a sale, there would be a reasonable and almost certain prospect that private operators could make sufficient profits to redeem their obligations in connection with such a purchase. For, while a steamer under any flag can continue to run without loss, these vessels could always make a reasonable profit, even with the handicap of American crews and under the United States laws.

In connection with this matter it should also be borne in mind that under the proposed arrangement the present propellers, tail-end and hold shafting could be used, and that the expense of refitting would thus be reduced very considerably as compared with the fitting of direct acting diesel engines.

America is the only country in which the refitting of the laid-up tonnage with the economical diesel engines and on a standardized principle can be accomplished, because this fleet is fairly uniform and consists, broadly speaking, of only three classes of vessels, to which various units of power manufactured on standardized principles can be allocated. . America also has the advantage of having these vessels in one hand—that is, the Shipping Board—and of having the necessary capital, material and engineering skill to produce these standardized units of power. But it is to be assumed that other nations will adopt, in due course of time, similar power installations, enabling them to successfully compete against the American ships.

In view, however, of the fact that most of the tonnage under foreign flags is on the average very much older than the American ships which are to be refitted, also that nearly all the foreign ships differ from one another, as much almost as ladies' bonnets, the refitting abroad on a systematic scale, such as I advocated in this article, is not likely to be easily accomplished, and the prospect, therefore, is that many of the old steamers will have to be scrapped when the American vessels fitted with diesel engines enter into competition with them. At the same time, it is to be anticipated that foreign nations will then start to build new diesel engine vessels and will probably produce them also on a systematized or standardized principle. In that case the battle will have to be fought out on its merits, and American shipowners will have to see how far they can meet the lower-priced foreign competition by superior methods of management and eventually by government help.

(To be continued.)

[Editor's Note.—In the second and final installment of this article Mr. Holzapfel takes up the insurance factor and puts forward some rather startling suggestions for mutual cooperative insurance. He also considers handicap of high wages and suggests a positive method of curing same by using naval crews and officers and shows how it would be possible through a combination of all of these suggestions and by operating through large corporations to keep the American merchant marine operating at a profit.]

CONDENSER TUBES

Some Considerations on Tube Failures and Their Prevention

By WILLIAM R. WEBSTER*
Vice-President, Bridgeport Brass Company

THE first part of Mr. Webster's paper on condenser tubes shows how a small percentage of tin introduced into the copper zinc mixture was found to retard the corrosive action of sea water and hence was developed the Admiralty mixture.

Season cracking is shown to be preventable by a moderate degree of annealing.

The process of casting the shell and subsequent drawing and annealing to make the finished Admiralty tube is described.

Having thus introduced us to condenser tubes as a finished product, Mr. Webster goes on to the more interesting topic (from the standpoint of a marine engineer), "Why Tubes Fail."

While perfection of manufacturing practice may well be stressed as of importance in the way of good workmanship, experience does not indicate that it is of much consequence on the whole in preventing corrosive attack. The belief is very widely held that the control of annealing temperatures within close limits and extreme freedom from visible mechanical defects are essential to satisfactory endurance. In the former case, fortunately, ample evidence is available and merely lacks sufficient examination. The tubes in a condenser usually fail in succession, some giving a much longer life than others. Such failures must be due to causes either internal or external to the tubes. The latter in individual condensers do not usually vary greatly from tube to tube and when differences in this respect do occur they can usually be detected. Under these circumstances, when variations in detectable internal conditions exist a sufficiently large number of observations should be able to determine with certainty any relation existing between any specific internal condition and superior or inferior service endurance.

For example, if a small crystal structure is more conducive to long life than one relatively large, the earlier failures in an individual condenser will be found upon examination to possess, on the average, larger crystals than those which fail subsequently, with some degree of proportionality observable between the crystal size and the life of the tube. Comparative examinations of large quantities of failed and unfailed tubes from the same condensers, while always showing variations in crystal size of considerable amounts, have not given the slightest support to this belief.

Similarly, attempts to explain observed failures by the presence of mechanical imperfections have been unfruitful. Dr. C. D. Bengough, than whom there is no higher authority, in discussing this factor has stated that "in my experience it is very rare for tubes to fail from this cause." Should, however, the facts above mentioned be admitted by all, that alone would contribute but little to the solution of the problem of condenser tube failure. On the other hand, if such admission should serve to direct attention to the importance and necessity of more intensive study of the causes of corrosion which reside within the condenser, much would have been accomplished in the direction of substantial progress.

William R. Webster, author of this paper on Condenser Tubes and one of the leading authorities in the country today on copper, brass and bronze, was born at Oyster Bay, Long Island, his family being of Connecticut stock. He graduated from Cornell University in 1890 with the degree of mechanical engineer, soon thereafter associating himself with Westinghouse, Church, Kerr & Company. In 1892 he was employed by the Aluminum Brass & Bronze Company, which afterwards became the Housatonic branch of the Bridgeport Brass Company. During the depression of 1893, Mr. Webster became superintendent of the Bridgeport Copper Company, one of the pioneer producers in this country of electrolytically refined copper, which position he held until 1897, when he entered the employ of the Bridgeport Brass Company as foreman of its rolling mill.

Gradually, through his ability and broad knowledge of the brass industry, he became successively superintendent of the raw materials department, general superintendent, and finally vice-president, which position he now holds.

Corrosive Attack

A discussion of the precise mechanism of the corrosive attack involved in the failure of condenser tubes is beyond the scope of this paper. Suffice it to say, therefore, that the corrosive agencies existing in the average surface condenser using sea water are sufficiently active to make the destruction of any brass tube only a question of time, and that the reason why brass tubes last on the whole as well as they do is that corrosive action is usually accompanied by the formation of by-products which are distinctly protective. Specifically, if a piece of condenser tube be immersed in warm salt water containing air bubbles, corrosive attack will continue for a considerable period at a rate sufficient to completely dissolve it in a very few months. Also corrosive attack of a character not involving the formation of a protective coating may occur under perfectly normal conditions and proceed at a rate sufficiently rapid to perforate the tube in a few weeks.

Plug Dezinkification

Investigations of the subject of condenser tube corrosion have established a considerable number of distinctive types of attack, of which some of the commoner types demand attention.

Probably the most troublesome is that usually known as "plug type dezinkification," wherein approximately circular areas of the tube wall of small size are so attacked that the zinc appears to have been dissolved out, leaving a spongy mass or plug of copper behind. This action once set up continues at a rapid rate until the wall of the tube is perforated. The spongy copper is not strongly adherent and frequently falls or is washed out of place, leaving an approximately circular hole. This type of corrosion is the one which usually accounts for the rapid failure of new tubes. Perforations from this cause may take place within a few months or even weeks from the time the tubes are in-

Meeting of the ... Section of the ... held before the Metropolitan Section of the ... Society ...

stalled. The chemical reactions involved are complex but appear to be favored by a high degree of salinity. Frequently the attack occurs along the bottom element of the tube under conditions indicating that, when drained, water has collected in the bottom and that concentration due to evaporation has occurred. Attempts to produce this action experimentally have not been entirely conclusive. A slight inclination of the condenser so that the tubes will drain dry and the avoidance of sagging appear to have value as preventive measures and should always be adopted. Frequent thorough cleaning of the tubes when new is also desirable, particulaly if the condenser is out of service for extended periods.

Under certain circumstances a type of corrosion resembling this is encountered which differs from it in that the action, instead of being localized, occurs quite regularly throughout the entire wall of the tube and proceeds at a much slower rate until the whole tube becomes brittle and lacking in strength. This is observed usually only in installations that have been in operation for many years, although Muntz metal tubes generally fail in sea water from this cause in a relatively short time.

Irregular Action

Quite frequently failures occur from an action as a result of which the wall of the tube is dissolved in an irregular manner, sometimes involving extensive areas and sometimes quite restricted ones. Continuous action of this character usually reduces the thickness of the tube, particularly at and near the inlet end, so that the packing no longer functions, although it frequently localizes in a way that produces perforation without much thinning of the adjacent portions. Dr. Bengough has investigated this type of failure and proved conclusively that it is due to the presence of entrained air in the condensing water. This may be due to various causes, such as improper design of circulating pumps, leaks in the suction line or disturbances in the vicinity of the intake. He recommends soaking the tubes in quiescent sea water at 40 degrees C. for about a week. This appears to form a protective coating.

Care of Tubes

In general, tubes should be cleaned as frequently as possible, particularly when first installed. Deposits of foreign matter, especially when foul water is used, are fequently of a highly corrosive nature. In the writer's experience, iron protective plates properly attached to the tube sheets have a distinct value and should always be employed. The omission of the final pickling operation so as not to disturb the oxide scale formed in the final anneal has been recommended by distinguished authority. Experimental observations indicate that it is well worthy of extended trial.

This discussion heretofore has concerned itself only with tubes of Admiralty mixture, as their use is indicated in most cases where corrosive action is to be expected. In installations employing uncontaminated fresh water, Muntz metal gives satisfactory results. This mixture, which is approximately 60 per cent copper and 40 per cent zinc, is inherently cheaper than Admiralty and the process of manufacture less costly due to the fact that it is capable of being worked hot.

The writer has for years vigorously opposed the contentions of those who hold the belief that crystalline structure or mechanical imperfections are causative accompaniments of corrosive attack and in support of his position has presented evidence and cited authority. The attitude is not dictated by any lack of appreciation of the importance of these factors from the standpoint of good workmanship and practice, but results solely from the conviction that as long as their suspected presence is assumed to account for premature failures the sufficient remedy for which lies in increased severity of inspection, no progress in determining and controlling the factors depending on condenser design and operation is to be expected.

Tube Specifications

Engineers in the endeavor to avoid the very serious difficulties incident to the premature failure of tubes in service have exhibited considerable ingenuity and industry in drawing exacting and conflicting specifications. It can, however, be quite confidently stated that no facts whatever supported by any records of experience exist by which the observable or measurable properties of a condenser tube beyond those incident to good workmanship can be predictably related to its service endurance. The effect of such specifications, therefore, can only be to increase the ultimate cost of condensation. The American Society for Testing Materials has adopted specifications which, it is believed, comprehensively cover all the requirements of the best manufacturing practice and their unanimous acceptance by both producers and consumers alike could have no other result than to bestow on the industry all of the benefits incident to the introduction of standards into a situation in which they have had no previous existence.

In conclusion the writer wishes to point out the desirability of and necessity for a thorough investigation of condensers and the conditions under which they are operated as a means of providing data looking to the solution of the problem of tube failure. If in the presence of adequate records of temperatures, water velocities, shut downs, cleaning procedure, etc., failed tubes are withdrawn as they give out and the character of corrosive action involved in each case determined, much more progress will be made than through any amount of speculation based upon the physical and other properties of the tubes themselves.

NEW DIESEL ELECTRIC FERRIES

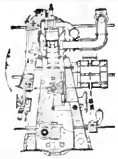
THE Golden Gate Ferry Company of San Francisco has placed a repeat order with the General Electric Company for complete electric propulsion and control machinery for two new steel hull, double-ended ferryboats. These crafts will, it is expected, be operated in the same manner as the ferryboats Golden Gate and Golden West, equipped with General Electric propulsion and control machinery, now running between Sausalito and San Francisco. It is expected the new boats will be run between the same points.

The two new ferryboats will be somewhat larger than the previous craft, having, instead of two main generating sets, three Werkspoor diesel engines, each direct-connected to a 270-kilowatt, 250-volt, direct-current generator, a 30-kilowatt auxiliary generator being mounted on an extension of each main generator shaft.

Two 950 150 s. h. p., 180 150 r. p. m., 750 volt, intermittently rated motors will be mounted in each end of the boats and direct connected to the propeller shafts. These motors will have a constant rating of 900 s. h. p. at 180 r. p. m. Ward Leonard type of voltage control will be employed and both pilot house and engine room control will be available.

The Golden Gate Ferry Company, with the installation of the first two electrically equipped boats, the Golden Gate and Golden West, inaugurated a radical departure in ferryboat construction, these being the first double-ended craft where each propeller was driven separately.

Oil Engines and Motorships



SOME CONSIDERATIONS ON THE CONVERSION OF STEAMSHIPS TO MOTORSHIPS

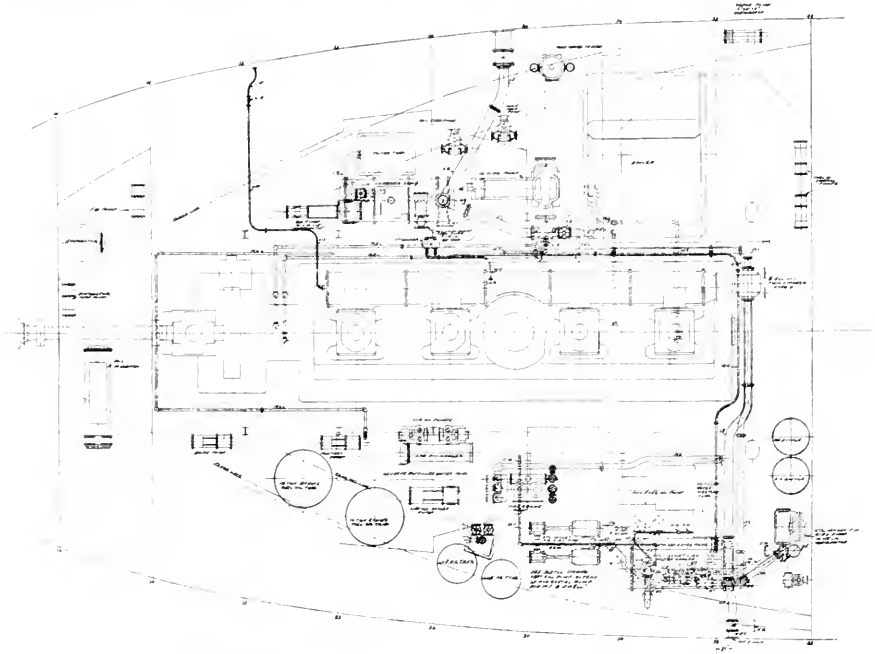
By ROBERT HAIG*

ONE of the first questions we had to consider on the conversion of an oil tanker to motor drive was whether the vessel should be arranged for diesel electric-driven auxiliaries or adopt steam auxiliaries by retaining one of the main boilers and such of the present steam auxiliaries as were suitable for the new conditions. The arrangement with steam auxiliaries reduces the cost of conversion if the units already on board are in good condition and can be worked into the new scheme of things found on a diesel motor-driven ship, but such an arrangement, while it shows very gratifying results in economy of operation and a certain reduction in cost of conversion, can hardly be expected to give such favorable returns as we have a right to expect will be obtained in a more complete diesel unit.

I have no hesitation in stating, however, there are indications that as new tankers are laid down the requirements for large boiler power for pumping out cargo will be dispensed with, and tankers will be built with main diesel motors and auxiliary motors, coupled to electric generators, with cargo pumps driven by electric motors, and such heating as may be required for fuel will be obtained from an auxiliary heating generator, deriving its heat from the waste gases from the main and auxiliary motors.

When the shipowner who handles cargo and passenger ships deals with the question of fitting diesel

* Abstract of paper read before the Society of Naval Architects and Marine Engineers, New York, November 9, 1923.



Plan showing arrangement of machinery and piping in the engine room of the Sun-Doxford diesel-engined motor tanker Miller County

ESTIMATED WEIGHTS OF PROPELLING MACHINERY FOR TANKERS

	Weight of machinery, long tons	Fuel oil required for 25 days trip	Total
B S Bidwell, 10,200 D W T, 3 Scotch boilers, 2,700 S H P., turbines, gears and steam auxiliaries, including water in boilers	1,560	900 tons—boiler	2,460
Duplicate of S S Bidwell, 3 Scotch boilers 3,000 I H P., triple expansion engine and steam auxiliaries, including water in boiler	670	875 tons—boiler	1,545
S S Bidwell, 1 Scotch boiler 3,000 I H P.; Sun Doxford Diesel engine and steam aux., including water in boilers	758	375 tons—eng. and boiler	1,133
S S Penna Sun, 13,000 D W T., 4 Scotch boilers, 4,500 I H P., quad exp. and steam aux., including water in boilers	1,000	1,500 tons—boilers	2,500
Duplicate of Penna Sun, 1 Scotch boiler, 4,500 I H P., Sun Doxford Diesel eng. and steam aux., including water in boilers	1,067	725 tons—eng. and boiler	1,792
Duplicate of Penna Sun, 1 small vertical boiler, 4,500 I.H.P., Sun-Doxford Diesel engine, Diesel and elec. aux.	1040	500 tons—boiler	1,540

The weights here set down for tankers with steam auxiliaries and steam heating and cargo pumping outfit indicate the minimum of structural changes due to conversion to Diesel motor drive which are probably the least favorable conditions, yet they show remarkable savings over the steamer, but it will be noted when we consider the straight Diesel motor drive with electric auxiliaries throughout deck and engineroom that we get economies in weight and fuel required that amply repay the extra investment.

motors, he is not immediately concerned with the consideration of retaining boiler power, beyond such small power as might be required for purposes of heating, which is only a minor matter.

In dealing with a general cargo boat, the same considerations have not had to be given to cargo handling as in the tanker, as we have no difficulty in obtaining electric-driven winches, windlass and steering gears of the highest type, which we have every reason to believe will be found much more economical in maintenance. With the electric auxiliaries, steam for power purposes can be entirely eliminated, and we thereby obtain the best conditions for a diesel motor installation, as there is no question of doubt but what an all-diesel installation is the ideal outfit.

Cargo boats engaged in overseas trade, as a rule, have long trips to make, where the accumulated savings of fuel and reduced fuel weight carried are of great importance, as the purchase of fuel in some foreign ports is a very serious expense. One further consideration that must always be recognized in the driving power of a diesel engine is that the power throughout the twenty-four hours does not fluctuate, as is so usual in steam-driven ships. With reliable running assured (and every day the diesel engine is becoming more so), the shipowner can count with a very satisfactory degree of accuracy the actual operating days his vessel is going to require to reach a certain destination.

Our experience has shown us that the ships now owned by the Shipping Board can, with very great advantage, be converted to diesel motor-driven ships, and it will be found later that in the higher powered passenger boats the savings in fuel and space will be still more substantial. The adaptability of the general run of the Shipping Board ships to diesel motor ships is admitted, and several shipbuilding firms are working on different types at the present time. The Sun-Doxford type for the power developed on a single screw is probably the shortest engine being built in this country at the present time, and, as has been shown, it can be placed in the same space as formerly occupied by a turbine job of similar power.

The Sun Shipbuilding & Dry Dock Company in the early part of the present year, in the adjustment of their business with the Shipping Board, purchased from the Shipping Board two oil tankers with Scotch boilers and geared turbines, 10,200 tons deadweight, and one general cargo boat, 11,800 tons deadweight with Scotch boilers and geared turbines, with the intention of converting these vessels from steam drive to diesel motor drive, by removing the existing steam machinery and installing a Sun-Doxford two-cycle opposed piston oil engine of 3000 shaft horsepower.

(a) The vessels were placed in drydock for examination of conditions and with a view to consider what, if any, structural alterations on the after part of the vessels would be required. The vessels were later taken off the dock and put in the wet dock, and the work of dismantling of the machinery proceeded with. The main engines and the center and starboard main boilers of the two tankers were removed, and such steam auxiliaries as were unsuitable for the new power were also removed. The existing auxiliaries that were retained were relocated, and new foundations built and such other auxiliaries as were required were provided for, the main engine foundations were built and a new main motor of the 4-cylinder type, 3000 shaft horsepower was installed, with the new auxiliaries arranged and located as shown. It will be noted that the port boiler appearing at the forward end of the machinery space is retained in its original position as when the vessel was a steamer; the only work done was to case the boiler in, except at the fore end where the entrance is into the fire room. This arrangement lends itself very readily to a good installation, causing the minimum of structural alterations. The whole of the machinery was installed with good, generous room for accessibility within the confines of the original bulkheads when the vessel was taken over. A new stern tube and shaft was fitted for the increased power put into the vessel over and above that previously developed with the turbines. The work proceeded very satisfactorily. The whole ship was overhauled and reconditioned in all tanks, quarters, etc., the vessel being docked the second time and put in good condition and painted, and after the work had been completed, dock trials were made while the vessel was lying at the yard. The engines worked uncommonly well, without the slightest vibration. I may state that we were without data as to whether these hulls would set up vibration with this machinery being so far aft, but we were agreeably surprised to find that the working of the machinery developed a steadiness beyond that obtainable, even with our quadruple engines.

Take the case of a tanker 12,500 deadweight tons, 3200 indicated horsepower, single-screw, leaving California for the east, burning 33 tons of oil fuel per day, which on a twenty-day steaming trip is equal to ..... 660 tons.
Additional for 3 days' spare fuel ..... 99 tons.
Stand by losses raising steam..... 20 tons.

Total..... 779 tons.

A diesel tanker of same size and power with steam auxiliaries would use 15 tons per day. Twenty days at 15 tons ..... 300 tons.
Additional for 3 days' spare fuel ..... 45 tons.
Stand by losses..... nil.

Total ..... 345 tons.

Difference, 434 tons, or, round voyage, 900 tons.

Taking the same vessel but fitted with electric auxiliaries, the consumption would be as follows:

Twenty days at 10.5 tons per day 210 tons.
Three days' spare fuel 31.5 tons.

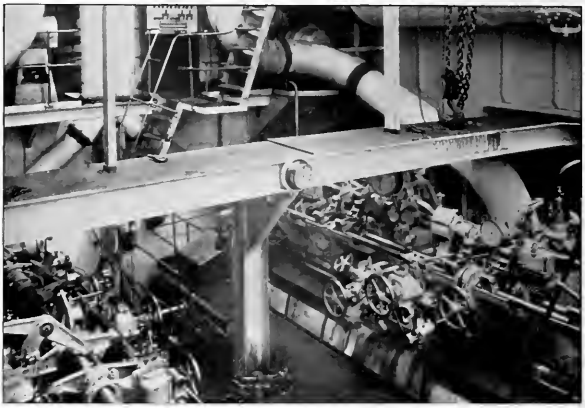
Total..... 241.5 tons.

Or a saving over the steamer for one trip 537.5 tons.
And for the round voyage 1075 tons.

750 TON-MILES TO THE GALLON

THE Norwegian motorship Handicap, of 9000 deadweight tons capacity and engined with two Sulzer 1350 brake horsepower 2-cycle type diesel engines, has recently completed a triangular run (San Francisco - Puget Sound - Australia-Japan-Astoria) of 17,634 miles.

This run was completed with no voyage or port repairs other than grinding compressor and fuel valves and cleaning the rotary slides. During this trip the Handicap had very severe tussels with typhoons in Asiatic waters and one big scrap with a Pacific Coast storm. The turbo-blower scavenging system, which, so far as marine installations go, was an experiment on the Handicap, has worked out with absolute reliability after two years of practically continuous service, and it is the testimony of the engineering officers on the ship that it works out to very good advantage in keeping the engine room cool and well ventilated in the tropics.



Upper platform in engine room of Norwegian motorship Handicap, showing control stand of Busch Sulzer diesel

The Handicap at first had some little trouble in maneuvering, largely because she had originally been intended for single screw and after conversion to twin screw had been sent to sea with the propeller aperture in her stern frame still open. During her former visit to the Pacific Coast this was covered in with plating and the Handicap is now handled with great ease.

We are printing herewith a reproduction of an abstract from the log of the Handicap covering this recent voyage. It is worthy of note that, having taken on 908 tons "Shellol", specific gravity 0.9, at $1.25 per barrel at San Francisco bunkers, the Handicap completed this 17,000 mile voyage without rebunkering and that 190 tons of the original oil remained in her bunkers on arrival at Astoria. This works out for a fuel cost of 32 cents per mile for a 9000-ton capacity carrier, or better than 750 ton-miles per gallon of oil. According to the figures of the engineer in charge, about 10 per cent of the fuel consumption at sea is in the auxiliary diesel engine driving the generator.

M/S HANDICAP", SAN FRANCISCO- PUGET SOUND- AUSTRALIA - JAPAN- ASTORIA U.S.A.
- 1923 -

MILEAGE

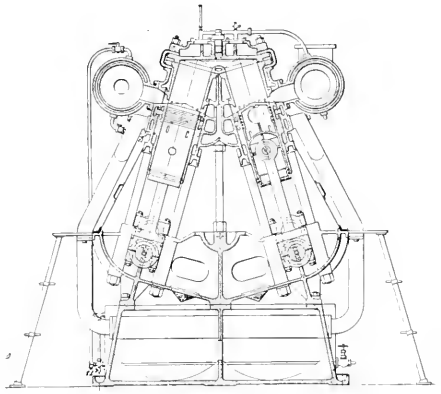
San Francisco -	Seattle	804 miles
Seattle -	Melbourne	7360 "
Melbourne-	Yokohama	4960 "
Yokohama-	Portland	4510 "
Total		17634 "

Date	Hour	Left	Arrived	Fuel in tons at Departure-Arrival		Aver. Fuel Consump. tons	Average Speed	Cargo
June 1	7.20 AM	San Francisco		966	)	9.2/	)	
" 2	7.30 AM		Humboldt Bay		957)	/24 hrs.)	11 knots)	
" 19	4.30 PM	Humboldt Bay		940	)	9.6/	)	
" 21	2.50 AM		Everett		923)	/24 hrs.)	11 knots)	Loaded 4,700,000 feet lumber.
" 28	12.05 PM	Everett						
" 28	4.30 PM		Tacoma					
July 1	9.35 AM	Tacoma						
" 1	12.00 AM		Seattle					
" 6	5.45 PM	Seattle						
" 6	7.55 PM		Tacoma					
" 8	6.20 AM	Tacoma						
" 8	8.30 AM		Seattle					
" 8	4.25 PM	Seattle		910	)	9.2/	)	)
Aug. 10	8.25 AM		Melbourne		618)	/24 hrs.)	10 knots)	Unloaded))
Sept. 8	1.20 PM	Melbourne		608				) the cargo)
" 10	7.45 PM		Sydney		590			) Loaded 8000
" 22	1.20 PM	Sydney		585	)	9.4/	)	) tons wheat)
Oct. 14	1.20 AM		Moji(Japan)		375)	/24 hrs.)	10 knots (	Unloaded)
" 24	1.20 PM	Moji		371			(	the
" 24	4.10 PM		Yokohama		353		(	cargo
" 31	7.25 AM	Yokohama		350	)	9.3/	)	)
Nov. 16	2.30 AM		Astoria		190)	/24 hrs.)	11 knots)	Ballast)

KNUDSEN DIESEL

ONE of the most interesting among the many designs in diesel engines which have recently been appearing is that of the Knudsen two-cycle engine. This design, as will be seen from the line drawings accompanying this article, is on the opposed piston plan, but is radically different from the majority of opposed piston engines, in that the cylinders are set on an acute angle with a common combustion chamber at their upper end, the piston rods working on entirely separate crankshafts, which are geared to a common shaft at center, transmitting power to the driven machine.

Designs for these engines are available in sizes from fifty horsepower up, or from four-inch bore up. The points of particular interest in the design are elimination of moving parts, increase of the mechanical efficiency, the possibility of standardization and quantity manufacture with reduced price per horsepower,

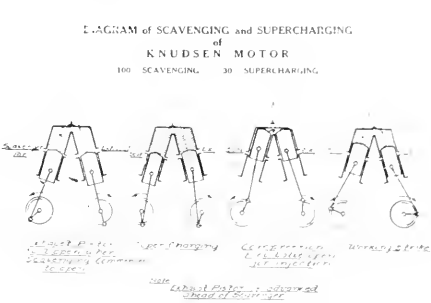


Sectional elevation of 240 brake horsepower Knudsen marine type diesel motor

and perfect scavenging and combustion combined with great reduction in weight per horsepower.

As will be noted from the graph showing the cycle operations, the piston controlling exhaust ports on its down stroke opens these ports in advance of the opening of the scavenging ports by the other piston. This allows the exhaust gases to escape through the exhaust port down to the point of atmospheric pressure before the scavenging air port is open. This method prevents any backing up of the exhaust gases and enables the scavenge air to sweep the cylinders clean under the comparatively low pressure of from $1\frac{1}{2}$ to 3 pounds per square inch.

The scavenging air pump is designed with a cylinder capacity equal to $1\frac{1}{2}$ times the capacity of the working cylinder of the engine. The exhaust piston, being in advance of the scavenging piston, covers the exhaust ports while the scavenging ports are still open, thereby insuring a slight supercharge of air into the cylinder and in consequence thereof more complete combustion. This supercharged combustion air is foced by both pistons into a common combustion chamber, which is so designed as to eliminate all dead spaces. The long stroke and comparatively small bore give a comparatively longer period for complete combustion of fuel and expansion of hot vapors in the cylinder, together with a higher engine speed, than would be possible with the ordinary construction.

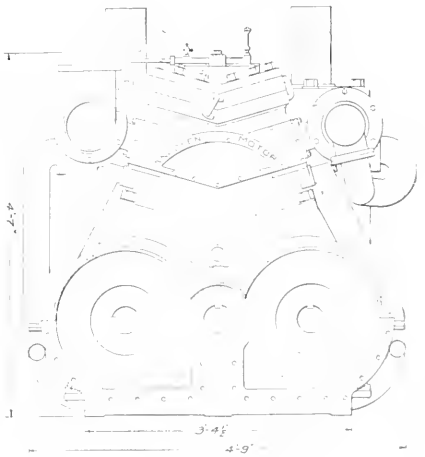


It is calculated that this engine in the larger sizes will not run above 50 pounds per shaft horsepower. In the 50-brake horsepower size it weighs about the same as the conventional highspeed gasoline engine of equal power.

The Knudsen diesel is of the solid injection type, fuel being sprayed into the cylinder through a spray valve actuated by a cam operated plunger pump under a pressure of 100 pounds. The length of stroke of the pump plunger determines the amount of fuel for each combustion chamber. Control of the fuel pump is so arranged that fuel injection may be retarded or advanced to any desired point of the piston stroke. This control may be adjusted with the engine in motion.

It will be evident that for application to marine drive the gearing between the crankshafts and central shafts can be arranged for reduction to the most economical propeller speed.

The Knudsen motor is manufactured by the Knudsen Motor Corporation, New York City.



End elevation of the Knudsen diesel

TRADE AND TRAFFIC TRENDS

A Department Devoted to the Interests of Exporters, Importers, and All Ocean Shippers

SOME PHASES OF OUR FOREIGN TRADE

By JAMES A. FARRELL*
Chairman, National Foreign Trade Council

OUR foreign trade is ever confronted by new problems. The most important phase of the situation today is that of making larger use of markets that hitherto have been regarded as secondary while the main flow of our exports and imports was with Europe. The thought and study of those connected with international commerce must be devoted with renewed vigor to this question. Until Europe begins to make definite progress against the forces that now threaten its economic position, we should be seeking to establish a more permanent position in other markets to absorb our surplus production. And at the same time, as our requirements in raw materials steadily increase while Europe's ability to produce them either diminishes or fails to keep pace with our growing demand, it is the course of ordinary prudence on our part to expand our activity in seeking such materials in other markets of supply.

This is a very important factor of our situation today. The full employment of our people is essential to prosperity in this country. It is the expansion of our industrial establishment which makes such full employment possible. This industrial establishment needs, for its full occupation, large and constant supplies of raw material. In many lines, probably in most of them, such supplies are available from domestic sources. But in some lines, even among those which use domestic materials, our own supplies are not sufficient to keep the plants fully occupied, and must be supplemented by importations from foreign sources. Also there are not a few of our industries, which employ many thousands of men and women and disburse a great many millions of dollars annually in wages, which are dependent upon foreign sources for their raw materials. No rubber, for instance, is produced in this country, but there are manifold uses of it among our people. Crude rubber to the value of something like a hundred million dollars is imported annually. We produce 68 per cent of all the cotton grown in the world, and consume 37 per cent of it, but there are more plants for the manufacture of silk in this country than there are for the manufacture of cotton, and no raw silk is produced here.

Suppose for a moment, merely for the sake of illustration, that some elemental catastrophe were to remove any of the countries producing materials not found in this country. A vast reorganization of our industry, our commerce and our life would be necessitated. But would our commerce and industry stop? Not at all. The reorganization would be made and we should go on with intensified energy in new directions. Does that not suggest the wisdom and the importance of taking steps now voluntarily in the same direction that such a disaster would compel us to take? There never was a time in the history of this country in which opportunities were greater for intensive study of neutral markets in the absorbing and fascinating work of developing new sources of supplise and new business in our products.

There are elements of difficulty in this program. Let us not forget that very often the overcoming of difficulties lends zest to the effort. Some of these difficulties are more than a little puzzling. We shall meet the competition of other trading nations that feel, as we do, the necessity of expanding their trade. For the present, and as long as conditions of inflation continue, especially among the more active of the industrial nations, we suffer under the handicap of their lower productive costs. This is particularly true in Germany, where, in the last few years, the chief industrial plants have paid off their bonds and mortgages in depreciated currency and are free from that important element of overhead. Other nations may have different elements of advantage. Belgium and France have it to a lesser extent. The British, for instance, have more widespread systems of communication and more greatly ramified financial institutions with which to serve their international commerce. The development of such facilities should occupy part of our effort. We have proved, in numerous lines, our effectiveness in organization of production. No doubt we can demonstrate a similar effectiveness in organization for distribution, and this a phase of foreign trade of paramount importance. Possession of effective physical agencies of commerce is of the greatest value. Production is the first; others are transportation, communication and finance. We need efficient American organization in all. This is particularly true of our merchant marine, with which highly important agency we are also encountering difficulties of our own production that are making it well nigh impossible at present to continue operations without large losses. It is now more than three years since the Congress enacted a law which declared it to be the policy of the United States to do everything necessary to maintain a merchant fleet under private ownership and in private operation. That law laid down a course of procedure for the United States Shipping Board and prescribed a rule of conduct for the board in its execution. The clear purpose of the act was to bring about the transfer of the government-owned war-built fleet to private ownership. Some progress has been made along that course, and as long ago as last April there were almost six million tons of ocean-going vessels under private American ownership, within a million two hundred thousand tons as much as was then owned by the government.

The proportion of American commerce borne in American vessels, however, has been going down as the proportion of privately-owned vessels has been going up. And this has occurred during a period in which the Shipping Board has been making active efforts to obtain cargo for American ships. These

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Merchandise on Consignment Especially Obligated

Merchandise shipped on consignment is especially obligated—first, for all transportation costs, and second, for the commission and expenses of the consignee. It is subject to embargo as property of the consignor, but such embargo is effective only after the two special liens just mentioned have been satisfied. In a legal action against a merchant who is in possession of consigned merchandise belonging to another, such merchandise cannot be embargoed.

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A consignee is responsible in favor of the owner of merchandise for the payment of the value of the goods and for all damages and losses which may be caused by his noncompliance with the contract. If he fails to make return of the proceeds of sales, the principal has the same right of action against him as against any contractual debtor and may demand judicial embargo of his property to satisfy the claim.—(Commerce Reports.)

JAPANESE TRADE

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Since the latter half of the calendar year constitutes the exporting season in Japan, it is very likely that exports will continue during December to balance up well against imports in spite of the fact that heavy receipts of reconstruction materials are clogging the different ports of entry. The first sudden rush into the foreign market by Japanese importers, to buy building materials for speculative purposes, now has subsided to a large extent. The government has taken action through the Bank of Japan and otherwise designed to discourage this sort of importing, and it is probable that receipts of this class of imports will show a falling off during the next few months. In order to keep down speculation with consequent raising of prices, it is very probable that the Japanese government will buy on its own account and resell to consumers sufficient building material to stabilize the domestic market.—(Commerce Reports.)

Commodity	November 1923	November 1922	November, 1921
Atlantic to Pacific.			
Manufactured goods			
Iron and steel	147,369	91,740	65,074
Railroad material	11,527	3,174	6,162
Machinery	11,889	10,673	3,806
Textiles	5,869	4,055	2,358
Mineral oils			
Crude petroleum	14,134	20,843	50,144
Lubricating	5,577	5,491	1,746
Refined	52,414	89,042	47,941
Metal ores	20,813	14,359	10,047
Coal and coke	51,882	53,884	52,853
Cotton	19,363	11,617	20,307
Asphalt	4,317	2,411	2,107
Automobiles	4,215	2,412	727
Cement	13,501	6,425	2,251
Paper	9,251	5,831	2,730
Sulphur	20,873	14,525	2,560
Tobacco	4,182	4,261	1,074
Other and general	170,883	273,478	124,866
Total	570,918	543,226	365,783
Pacific to Atlantic.			
Mineral oils			
Crude petroleum	85,320	35,965	26,437
Refined	56,151	24,744	3,134
Nitrates	88,504	233,078	8,951
Lumber	13,430	10,705	5,044
Barley	31,401	36,875	27,063
Borax	1,703		
Canned goods	34,142	35,553	24,045
Fruits	13,544	2,154	9,221
Coffee	5,852	2,252	5,765
Copper ores	11,353		
Metals, various	22,974	29,220	14,515
Grain, various	77,723	62,358	12,652
Rice	3,447	12,521	4,878
Tallow	6,679	4,708	4,864
Wool	27,460	41,849	11,210
Wood	1,766	6,253	4,369
Wheat	95,694	80,023	119,831
Other and general	152,205	154,166	83,747
Totals	1,583,381	925,482	468,750

Table showing the tonnage of various materials passing through Panama Canal in November

TRADE AND TRAFFIC TRENDS

A Department Devoted to the Interests of Exporters, Importers, and All Ocean Shippers

SOME PHASES OF OUR FOREIGN TRADE

By JAMES A. FARRELL*
Chairman, National Foreign Trade Council

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Commodity	November, 1922	November, 1923	November, 1924
Atlantic to Pacific.			
Manufactured goods			
Iron and steel	147,[illegible]	91,740	65,074
Railroad material	11,[illegible]	2,114	6,162
Machinery	11,[illegible]	10,122	9,806
Textiles	5,[illegible]	4,065	2,358
Mineral oils			
Crude petroleum	34,[illegible]	23,941	50,344
Lubricating	1,[illegible]	1,[illegible]	1,[illegible]
Refined	50,[illegible]	44,[illegible]	47,944
Metal manufactures	20,[illegible]	14,[illegible]	19,[illegible]
Coal and coke	54,[illegible]	39,[illegible]	52,[illegible]
Cotton	14,[illegible]	11,[illegible]	20,[illegible]
Ammonia	2,[illegible]	1,[illegible]	2,[illegible]
Agricultural implements	2,[illegible]	2,[illegible]	[illegible]
Cement	3,[illegible]	2,[illegible]	[illegible]
Paper	[illegible]	[illegible]	[illegible]
Sulphur	21,[illegible]	16,[illegible]	[illegible]
Tobacco	[illegible]	[illegible]	[illegible]
Other and general	[illegible]	[illegible]	124,[illegible]
Totals	[illegible]	[illegible]	[illegible]
Pacific to Atlantic.			
Mineral oils	[illegible]	[illegible]	[illegible]
Chemicals	[illegible]	[illegible]	[illegible]
Fertilizer	[illegible]	[illegible]	[illegible]
Nitrates	[illegible]	[illegible]	[illegible]
Lumber	[illegible]	[illegible]	30,564
Barley	[illegible]	[illegible]	27,[illegible]
Borax	[illegible]	[illegible]	[illegible]
Canned goods	[illegible]	[illegible]	24,[illegible]
Borates	[illegible]	[illegible]	[illegible]
Coffee	[illegible]	[illegible]	[illegible]
Gold at value	[illegible]	[illegible]	[illegible]
Metals and ores	[illegible]	[illegible]	14,[illegible]
Wool, clothing	[illegible]	[illegible]	[illegible]
Rice	[illegible]	[illegible]	[illegible]
Tallow	[illegible]	[illegible]	[illegible]
Wheat	[illegible]	[illegible]	[illegible]
Wood	[illegible]	[illegible]	[illegible]
Wheat	[illegible]	[illegible]	[illegible]
Other and general	[illegible]	[illegible]	[illegible]
Totals	[illegible]	[illegible]	[illegible]

Table showing the tonnage of various materials passing through Panama Canal in November

A SURVEY OF EUROPEAN CONDITIONS

By EDWARD PRIZER
President, Vacuum Oil Company

This survey was given at the close of an address on the topic "Things Abroad," read before the Fourth Annual Meeting of the American Petroleum Institute at St. Louis, December 12, 1923. The following eloquent and worthy sentiment closes the address:

"Except the Lord build the house they labor in vain that build it." So spake the Psalmist centuries ago. He was uttering no pious proverb but a fundamental truth underlying all human activity. Unless there exists among men righteousness, justice and mercy, the structures reared by their hands will collapse when the moral upheaval comes, as surely as did the cities of Japan when shaken by the earthquake. Europe today is rocking on her foundations. May the United States, the strongest country on earth, point the way of moral and economic regeneration.

IT seems to me that there is at present in Europe, with the possible exception of France, a growing distrust of the old-time political leaders and a groping after a new leadership in the hope that somewhere and somehow relief may be secured from the present condition of wretchedness and distress. This is evidenced by the readiness with which people are submitting to movements which result practically in a dictatorship.

A hasty survey of conditions as at present existing in certain of the European countries may be of interest, and I therefore venture to make the same.

France

When France views afresh the wide belt of frightful desolation spread across the whole breadth of her fair country from the Swiss border to the sea, and recalls that not a single city, hamlet or farm in all of Germany shows even a scar from the war; when she considers the wanton destruction of her mines and factories and remembers that all of Germany's industrial plants are intact and ready to function to full capacity, rage and fear well up afresh in her breast. Do you wonder?

It is estimated that the French peasant was a subscriber to the Russian bonds in proportion to about four out of seven. He has little hope of ever obtaining any part of this investment. He has, however, now subscribed as liberally as he is able to French government issues and, believing that his government must secure from Germany the means to pay these bonds, he is determined that Germany must pay her debt. Unfortunately he does not know the real situation in Germany and is convinced that Germany does not pay, not because she is unable, but because she is unwilling.

French Political Leaders Sowing the Whirlwind

The French people are thrifty to the point of avarice. They are demanding full compensation for their tremendous losses, for which they feel they are in no sense responsible. Propaganda has played its part in their convictions, and until they are convinced by indisputable evidence that Germany cannot pay the vast sums demanded of her, French clamor for reparations to the maximum will continue. Her political leaders, it seems to me, are sowing the whirlwind by fostering expectations that cannot be realized.

At the present time France presents the appearance to the casual visitor of much prosperity. Her battlefields, which were pitted with shell holes and fertlized with human blood, have been reclaimed and are bearing ample crops. Her destroyed cities and villages are being steadily rebuilt, creating great activity, which is resulting in practically no idle labor. Her mines and factories are slowly being restored. Her people are industrious and returning again to their old-time habits, and were the fear of Germany lifted they would slowly regain their former individual prosperity.

The danger to France as a nation at the present time is the fiscal burden which the government has assumed in her military organization and in the costs of reconstruction. This is evidenced by the fact that the French franc stands at substantially less than one-third of its pre-war value, and inflation may continue and accelerate its depreciation. No friend of France denies her the right to receive from Germany reparations for the merciless devastation which the German armies caused her, but the vital question today is—How much can Germany, pay and when? French expectations, based upon an impossibility, can result only in ultimate disaster.

Germany

If evidence was needed to prove that "the way of the transgressor is hard," Germany today furnishes it. Broken, friendless, discredited, and distrusted, she is overwhelmed with disaster. It was necessary, however, that her people should at last learn that war does not pay. Three times within seven years, between 1864 and 1871, had she waged short and successful wars which added to her territory and increased her wealth. She had come to believe that war was a great national game which made for prosperity by spoilation of neighboring countries. Her people in entering the Great War fully expected a repetition of the three preceding wars, and the ultimate safety of Europe could only be brought about by a crushing defeat. However, no sooner had her military authorities returned from France than they began their old-time propaganda methods. They spread for home consumption the assertion that the German armies had never been defeated, and only ceased fighting because of lack of support from home, thus trying to keep alive the belief in German invincibility. Easy terms of peace, which would have prevented distress from touching every household, would have kept alive German militarism.

While her military defeat reduced her to sore straits it is questionable whether her present situation is not the result of truculent and evasive tactics, indicating a purpose to evade and escape in every way possible from the penalties which rightfully were demanded of her. The world distrusted her because it lacked evidence of a serious purpose to admit and face her penalties.

It is doubtless true that the total sum of reparations demanded of her is beyond her ability to pay, but she lost instead of gained the world's sympathy by the methods she pursued because of the belief that she was trying to escape paying what she really was able to. French sentiment was goaded into offensive action because of this belief. German psychology, with its usual misunderstanding of other peoples, endeavored to create sentiment by flooding the United States

(Continued on page 38)

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

THE KIDWELL TWO-FLOW RING-CIRCUIT BOILER

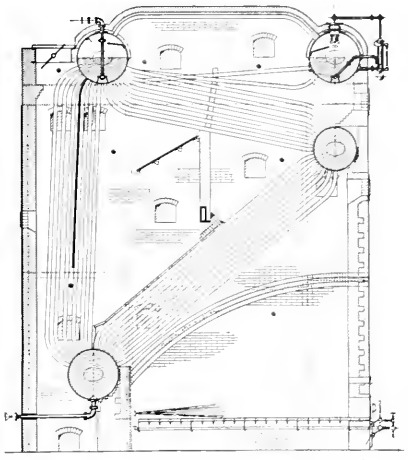
ABOUT the year 1893 Dr. Edgar Kidwell, then professor of mechanical engineering at the Michigan College of Mines, Houghton, Michigan, reached the conclusion that most of the previously unexplained boiler explosions, as well as the more serious operating troubles with boilers, were due to wide variations in the level of the water in different parts of the pressure vessel, and the rapidity with which these fluctuated as the load changed. The longer the subject was studied and investigated from this standpoint the more the accuracy of this opinion was confirmed.

It was therefore natural to conclude that if a design could be produced which would completely overcome this fundamental deficiency, yet introduce no objectionable features to offset this desired one, such boiler would represent the greatest advance made in steam generator design for many decades.

The solution of this problem was therefore undertaken and twenty-five years later was solved in the present design of the Kidwell two-flow ring-circuit boiler.

This boiler design introduces an entirely new principle of arrangement in water-tube boilers, namely, that in which the main circulation path takes care of only the generating and delivering of the steam into the disengaging drum, which a second or supplementary circulation, subordinate to the main circuit as to the amount of water it passes, holds the water surfaces of the two drums at the same level. This principle applied to the old Gurney ring-circuit design gives the present Kidwell two-flow ring-circuit boiler.

Referring to the sectional drawing reproduced herewith, feed water enters at the upper left-hand drum, flows down through the left-hand tube bank to the lower or mud drum, up through the right-hand tube bank to the lower right-hand drum and across the upper tube bank to the upper left-hand drum again, where it is disengaged as steam and flows over the drying tubes at top of boiler to the upper right-hand drum and so out through the steam outlet. The drum at upper left and that at upper right are connected below the water level with a supplementary circuit which has the effect of balancing their water levels and insuring constant water endurance surface.



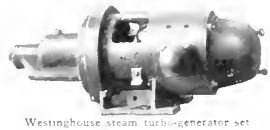
The Kidwell two-flow ring-circuit boiler arranged for oil firing

It is claimed for this design that it has been operating for years with safety and economy at overloads far beyond the ability of any other design depending on natural circulation; that it will maintain under all conditions an equality of water level over all parts of the water circuit in the boiler; that it eliminates priming and delivers steam superheated 5 to 45 degrees according to rate and method of firing; that it is more readily and to a greater degree adaptable to superheater installation than any other design; that it automatically cleans the steam before delivering; that because of these facts and the very careful designing of the details of furnace and boiler construction. It exceeds all other boiler designs in the matter of capital or investment efficiency.

It will be noted that the mud drum is suspended from two tube banks, and is free to take up expansion movement; the lower right-hand drum is also supported from the top in such fashion that it takes care of expansion in the upper tube bank. Particular attention has been given to the designing of baffles so as to insure tightness, and the placement of these baffles together with the furnace volume proportions is such as to produce maximum absorption of direct-radiant heat and practically complete combustion of volatile matter.

The details of the Kidwell two-flow ring-circuit boiler have been worked out to great perfection and standardization of parts has been carried out to a degree never before attempted in this class of work.

The boiler is manufactured by the Kidwell Boiler Company of Milwaukee, Wisconsin, who are represented on the Pacific Coast by Hunt, Mirk & Company., Inc., of San Francisco.



Westinghouse steam turbo-generator set

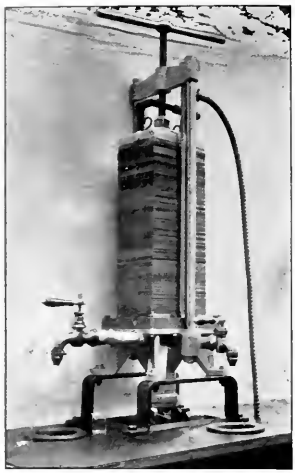
A HANDY TURBO-GENERATOR

A SMALL, non-condensing, steam turbine-generator lighting set of unusual simplicity and ruggedness has been developed recently by the Westinghouse Electric & Manufacturing Company for use in oil well rigs, steam shovels, isolated pumping plants, and general outdoor construction work. It is equally applicable for service on tugboats, yachts

and small craft, for the generator coils are specially impregnated and parts needing such protection are heavily sheradized.

The unit, which is capable of generating 1500 watts at 115 volts direct current, consists of a single wheel, of the Westinghouse impulse, re-entry type, and a specially designed direct current generator. It is unusually simple in design and substantial in construction, with only five castings and five moving parts. The moving parts are the shaft carrying the generator armature and turbine rotor, two governor weights, the governor spindle, and the valve stem. The outfit requires no bedplate or foundations, the whole unit being supported by feet on the middle casting, which contains the generator inboard bearing. These feet can be secured to any substantial horizontal support with four small bolts, studs, or lag screws. This construction prevents distortion from bolting down or from the expansion of the parts due to heating.

The unit complete is 32⅜ inches long, 14⅛ inches wide and 12½ inches high. Its net weight is 250 pounds.



A Hele-Shaw streamline filter, small vertical industrial type

Streamline Filtration

ON May 10, 1923, Dr. H. S. Hele-Shaw read before the Royal Society at London a paper describing discoveries he had made while experimenting with streamline flow of liquids. Dr. Shaw in carrying on his experiments had attenuated streamline flow to very thin sheets for observation purposes and in those experiments he discovered the remarkable fact that it was possible by so attenuating the stream flow of liquids to obtain better and more rapid filtration than had been possible with any of the ordinary filtering methods in use in the industries. This paper created a great deal of attention so that numerous papers have been read since by the doctor to various scientific and engineering bodies, and corporations have been formed for the commercial manufacture and distribution of filters on the Hele-Shaw system.

In this system of filtration the liquid does not permeate or pass through any filtering material. It is passed in thin films between the laminae of suitable material, usually a special brand of waterproof paper. This material is stamped in sheets with alternate rows of perforations, one row containing small holes and the next row containing comparatively large holes. A suitable number of these perforated sheets are held together under the proper pressure, the result being a pack of paper sheets with large and small passages running through its entire length.

The large passages are filled with the liquid to be filtered from a common pressure chamber at the head of the filter and [illegible] ite in a common sludge chamber at the base. The small passages are [illegible]d in a common outlet for the [illegible] The liquid to be filtered [illegible] way, under pressure, from the large holes through the minute passages between the paper sheets into the small holes.

It will be seen then that the porosity of this filter pack can be regulated by adjusting the pressure with which the sheets are held together. A screw in the head of the filter allows for this adjustment, and, as the pressure on the material to be filtered can also be varied at will, it is evident that the streamline principle of filtration is adaptable to any combination of liquid and sludge and to any degree of filtration predetermined for any specified filtrate.

Some results have been obtained with the use of this filter which have hitherto been deemed impossible. Peat water, formerly defying all efforts at filtering, is easily rendered clear and drinkable by the streamline method. A solution of the dye ethyrosin, which is an intense orange color in a dilution of one to five millions, is easily filtered to a perfectly clear and colorless liquid. Emulsions of oil and water are separated perfectly. Some remarkable results have been obtained with the streamline filter in recovery of lubricating oils, as, for instance, oil taken from the crank case of a gasoline motor, as a thin emulsion full of solid particles of a colloidal nature, on passing through the filter became a perfectly clear yellow oil, superior in many respects to the most highly refined new oil of the same chemical composition.

Such products as crude cottonseed oil can be refined and purified in one process. Waste liquors from gas and other chemical works may be purified at the commercial rate of discharge so that they can be freely dumped into rivers. Boiler feed water can now have oil and other impurities absolutely removed at its regulation commercial rate of feed. Crude sugar cane juice has been successfully refined and purified by this filter.

In commercial and laboratory types the working pressures so far found necessary have varied between 50 and 175 pounds.

Cleaning of the filter can be taken care of in various ways. Two types of mechanical cleaning have already been developed and are available. If the residue or deposit is not to be saved it can be washed out readily by simply opening the sludge chamber.

This filter in its present form can be adapted to handle any desired quantity of material at any specified rate.

The Streamline Filter is manufactured and distributed in America by the Streamline Filter Corporation, 95 Liberty street, New York, whose engineers are available for consultation or any further information desired by interested parties.

BRONZE CASTINGS FOR SHIP CONSTRUCTION

RECENT developments in the manufacture of bronze for shipbuilding purposes and the perfection by the William Cramp & Sons Ship and Engine Building Company of such a metal with a strength under tension greater than 100,000 pounds to the square inch have resulted in two enormous contracts which give the Cramp Company supremacy in this field.

The United States Shipping Board has awarded a contract to the Cramp Company for the manufacture of manganese bronze propeller blades aggregating about half a million pounds and constituting the requirements of the government merchant fleet for six months. These blades will weigh from 4000 to 9000 pounds each and will be used on ship propeller wheels ranging in total weight from 20,000 pounds to the steamship George Washington's 48,000-pound propeller, the largest of any vessel afloat. All of these blades will be cast of the highest quality bronze with a strength exceeding that of steel. To turn out these propellers the Cramp Company has at its command the largest marine brass foundry in the world with a capacity of at least a million pounds per month.

Another large contract just awarded the Cramp Company was placed by the Oxweld-Acetylene Company, a leading member of a $200,000,000 consolidation. This contract calls for 250,000 pounds of manganese bronze welding rods to be used in the oxy-acetylene process of high fire brazing of malleable iron, brass and bronze castings. Formerly such castings when broken had to be thrown away, but this new process of brazing has, with the aid of the Cramp product, revolutionized the business of repairing castings and resulted in the saving of countless castings that would otherwise be scrapped.

The United States Department of Commerce, through its Division of Simplified Practice, has given signal recognition to the predominance of the Cramp Company in the manufacture of bronze for marine purposes by the appointment of W. P. Smith, sales manager of the company, as a representative of the American Marine Standards Committee in such activities of the American Society for Testing Materials as deal with the standardization of brass and bronze alloys. The growing use of bronze for marine work and the importance of the parts of a ship and ship machinery in which it is used demand that the preparation of such specifications be placed in the hands of thoroughly experienced marine men.

The prominence of other departments of the Cramp Company in the marine field is also recognized in appointments by the Department of Commerce of the following named officials of that company for similar work in their particular lines: W. A. Dobson, naval architect, chairman of Technical Committee on Hull Details; J. F. Metten, chief engineer, member of the Committee on Engineering Insulation; J. C. Shaw, marine engineer, member of Committee on Shafting; G. C. Matlack, superintendent of foundries, member of Committee on Bitts and Cleats; and C. A. Pierce, electrical engineer, member of Committee on Electrical Installations on Shipboard.

BOOK REVIEW

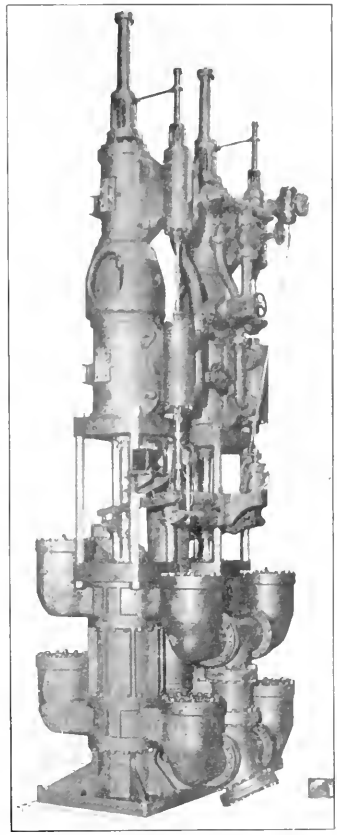
H. O. Publication No. 203, The Sumner Line of Position, furnished ready to lay down upon the chart by means of Tables of Simultaneous Hour-Angle and Azimuth of Celestial Bodies.

It is desirable that navigators should be informed of the delivery by the Government Printing Office of this volume, in which the Hydrographic Office has provided the means for the practice of a new method of finding position in navigation from the observation of the altitude of the sun or other celestial body.

The chronometer time of the observation of an altitude indicates the longitude from Greenwich of the meridian, on which the observed celestial body is located. The tables of this publication give the hour-angle, or longitude counted from the meridian of the observed body of the intersection of the observer's position-line with a designated parallel of latitude, so that the longitude from Greenwich of this point of latitude of the observer's position-line is immediately found by algebraically adding together the longitude of the observed celestial body indicated by the chronometer and the longitude of the observer from the observed body, taken from the tables, and hence, since the azimuth of the observed celestial body is tabulated by the side of the hour-angle, the position line may be at once drawn through the point thus found in a direction at right angles to the bearing of the observed body, as indicated by the azimuth.

Divested, as it is, of the use of logarithms and, indeed, of all computation within the usual meaning of that term, and requiring reference to only a single page of the table, the solution is of unusual simplicity and brevity among navigational methods which yield results suffering no detaction from theoretical accuracy, and renders the course of procedure the same, whatever the situation of the observed body in the heavens may be, provided only that the conditions admit of the accurate measurement of the altitude at a known instant of time.

The limits of the tables in H. O. No. 203 are latitude 60 N., to 60 S., Declination 27 N. to 27 S.



Vertical compound direct-connected steam cargo pump of 3000 barrels per hour capacity, designed by the National Transit Pump and Machine Company for installation on large tankers.

The statutory price of this volume of 689 pages has been fixed at $2.25. By remitting this amount to the Hydrographic Office, Navy Department, Washington, D. C., the book may be obtained.

This book may also be obtained from the agents for the sale of Hydrographic Office publications.

The Hydrographic Office is now preparing computations for another volume to be known as H. O. No. 204, carrying declinations to 60 N. and 60 S., which will provide data for practically all stars used in navigation not included in the limits of the tables contained in H. O. No. 203.

"A GOOD SCOUT"

U. S. Scout Cruiser Raleigh Completes Official Trial

THE U. S. scout cruiser Raleigh built for the United States Navy by the Bethlehem Shipbuilding Corporation at Quincy, completed her official trials on December 22. The trial performance proved that this new scout cruiser is superior to any of her class, in fact, according to naval authorities, this is the finest cruiser that has been built. In both the preliminary and official trials, this vessel made every test in such a manner that both the builders and Navy officials agree that she has excelled her sister ship, the Detroit, which was delivered to the Navy a short time ago. The Raleigh carries all of the latest improvements and is the most modern vessel of her type afloat.

The Raleigh is 550 feet in length, with a breadth of 55 feet and a normal load displacement of 7200 tons. She carries twelve 6-inch rapid fire guns of the very latest model, four three-inch anti-aircraft guns, capable of firing into the air at any angle up to ninety degrees. She also carries ten torpedo tubes and two hundred mines which can be launched in a very few minutes. This vessel is also fitted to carry airplanes, which can be launched from a revolving catapult while running either with or against the wind. She is also equipped with high power radio apparatus, wireless telephone, submarine signaling, and electric steering gear, and has fully equipped hospital, laundry, workshops, etc.

Propelling Machinery

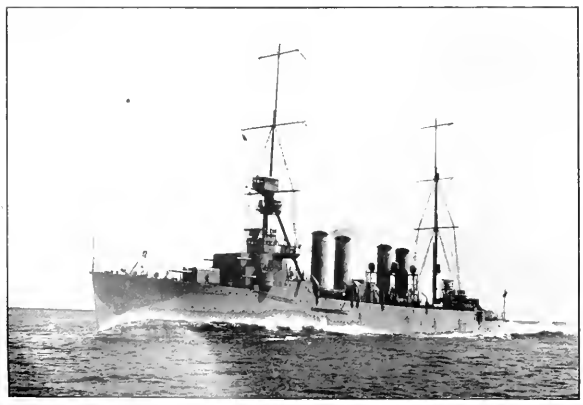
The propelling machinery, which was designed and constructed by the builders, developed one hundred thousand shaft horse power on her trial. This is sufficient to drive this vessel at a speed of better than forty-one land miles per hour. Steam is generated in twelve oil-fired watertube express type boilers, three located in each of four water-tight compartments and operated under forced draft. There are two watertight engine room compartments amidships, in which are located the powerful Curtis type marine turbines, which operate at a speed of 2500 revolutions a minute, this being reduced through mechanical gearing on each of the four propeller shafts to 400 revolutions a minute.

Some idea of the power of this operating machinery may be obtained when one realizes that in the boilers there are about 65 miles of steel tubing in which the steam is generated at a rate of one million five hundred thousand pounds per hour with a pressure of two hundred and sixty-five pounds per square inch. The main turbines are fitted with approximately thirty-two thousand blades, some of which rotate at a speed of eight miles per minute. The four main condensers located in the engine room require seventy million pounds of sea water per hour to condense the exhaust steam from these turbines. At full capacity the boilers will consume about one hundred thousand pounds of oil per hour.

The U. S. scout cruiser Raleigh on dry dock

The Raleigh was delivered to the Navy Department during January, and will be under the command of Captain W. C. Watts, who will have as his staff officers Commander R. N. Brainard and Lieut. Commander H. R. Keller. These officers, together with Captain Schlabach, Naval Constructor; Commander Bean, Inspector of Machinery, and General Manager S. W. Wakeman of the Fore River Plant of the Bethlehem Shipbuilding Corporation, accompanied the trial board on this trial trip.

The wonderful showing of the Raleigh made during these trials is a high tribute to both the Naval inspectors and the management of the Fore River Plant.



The U. S. S[illegible] Cruiser Raleigh on her trial trip

The Collingwood Shipbuilding Co., Collingwood, Ontario, has received an order from Mathews Steamship Co., Toronto, for a bulk freighter. The dimensions will be: length, 550 ft.; beam, 58 ft.; molded depth, 31 ft.; approximate deadweight tonnage, 13,000; carrying capacity, 425,000 bushels of wheat. The ship will be built on the transverse webb beam system to the highest classification for lake service. The propelling machinery will consist of triple expansion engines, 24½, 41½ and 72 in. by 48 in. stroke, steam to be supplied by three Scotch boilers with a working pressure of 190 pounds, developing 2800 horsepower.

PACIFIC MARINE REVIEW'S
WORKBOAT AND PLEASURE CRAFT
POWER

NEW DIESEL DREDGE TENDER FOR THE PORT OF PORTLAND

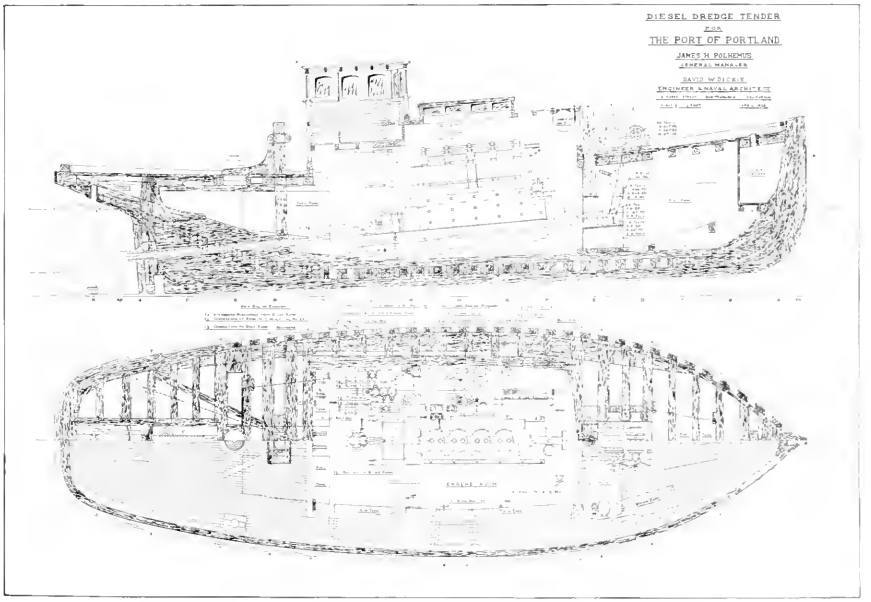
A DIESEL-DRIVEN dredge tender of novel type is now being built by the Port of Portland at their own plant to designs by David W. Dickie, San Francisco naval architect and marine engineer, both design and construction being under the direct supervision of James H. Polhemus, general manager and chief engineer of the Port of Portland.

The Port of Portland operates four steam dredges, using "Hog fuel" (chopped slab wood and sawdust) under the boilers. Each of these dredges has been served by a steam tender, the duties of which included towing large barges of "Hog Fuel" from various mills along the Columbia and Willamette rivers, distances varying up to 140 miles; shifting of anchors weighing 7000 pounds; lifting heavy dredge repair parts and transporting same to the shops; running anchor lines; and working pipe lines into place. Although the service of these tenders is quite intermittent, the laws and regulations of the Steamboat Inspection Service compel double crews on the steam tenders, so that the expense of operating these tenders is about $2200 per month per tender.

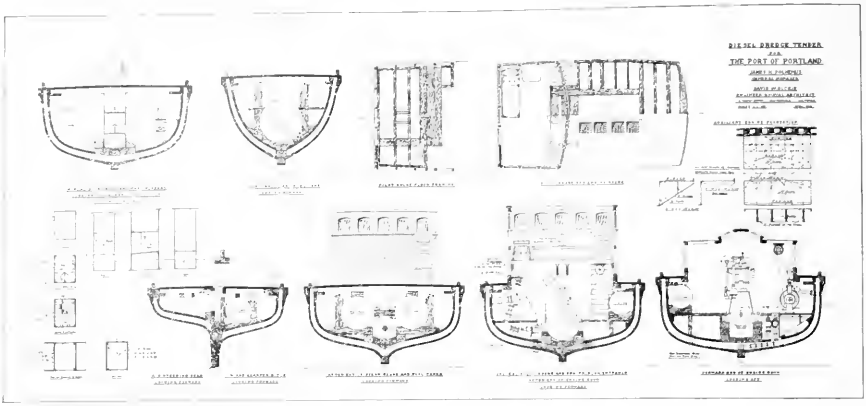
When a new tender became necessary it was estimated that by substituting diesel power with one-man control for steam the tender could be operated on approximately $550 per month. It was therefore determined to use diesel power and the present design is the result.

It will be evident that a powerful staunch hull with large stability, flexible trimming arrangements, and large fuel capacity, is required for this use. As will be seen from the drawings reproduced herewith the boat is entirely of timber construction. As the experience of the Port of Portland showed that frames, deadwoods and planking above the water line have a tendency to rot in this service, Port Orford cedar was used throughout except for underwater planking.

The general dimensions are:
Length over all, 64 feet 10 inches.
Displacement length, 58 feet 6 inches.



Inboard profile and sectional plan of new diesel-engined dredge tender for the Port of Portland



Section showing details of hull work on the new diesel dredge tender of the Port of Portland

Beam molded at water line, 19 feet 7 inches.
Beam over yards, 21 feet.
Draft at 4-foot, 5 feet 8 inches.
Draft at sternpost, 7 feet 6 inches.

The sizes of scantling are as follows: Keel, 10 inches by 12 inches; keelson, 8 inches by 16 inches; frames, 5 inches sided double; engine timbers, 14 inches sided; ceiling, 3 inches; clamps, 4 inches by 12 inches; planking, 2½ inches; deadwoods, 12 inches sided; beams, 8 inches by 8 inches; decking, 3 inches by 3 inches. The general arrangement of machinery, crew quarters and deck spaces will be noted on the drawings.

Machinery

The main propelling unit consists of one Pacific Werkspoor diesel engine of 4-cylinder 4-cycle marine type directly coupled to a single screw propeller. This engine has a cylinder bore of 300 mm. and a stroke of 500 mm. At 225 revolutions per minute it develops 202.32 horsepower with a fuel consumption of .461 pounds of fuel per horsepower hour, these figures being the result of shop test runs in diesel fuel. The engine was also tested on boiler fuel oil, this being heated to about 120 degrees Fahrenheit and giving practically the same result as the diesel fuel. An auxiliary Scandia semi-diesel engine of 9 horsepower is installed, which is connected on one side through a clutch to an auxiliary air compressor for maneuvering air and on the other side though a clutch to a Krogh 4-inch by 9-inch centrifugal pump, for wrecking and fire purposes.

The deck machinery consists of a heavy double-drum winch mounted forward and driven by roller chain drive from a Jack shaft geared to the forward end of the main engine. The boat is lighted by electricity throughout, power being provided by Robins & Meyers gasoline engine driven generators. Two sets of batteries are installed in the electric system, one for the lights and one for ignition coils. The switchboard was supplied by Etts-Hokin & Galvan.

Hand and power steering, engine reverse and control are all managed from one stand in the pilot house, so that it is confidently boped that this new tender will easily be operated by two men, calling on the dredger crew for deck hand help when shifting anchorage or handling heavy parts.

NOTES FROM SHOP AND YARD

J. H. Madden, shipbuilder, has an order for construction of a two-masted seagoing yacht to cost in the neighborhood of $75,000 for R. C. Durant. The dimensions will be 104 feet on deck, 21 feet beam, 12 feet depth. She will have an auxiliary engine of 80 horsepower.

* * *

Olson & Sunde Machine Works, Seattle, is constructing three halibut schooners for A. Ringstad, T. Lewiston, and Johnson Brothers & Jensen. The vessels will be 56 feet long, 15 feet beam, 11 feet 9 inches draft and will be equipped with 50 horsepower gasoline engines.

* * *

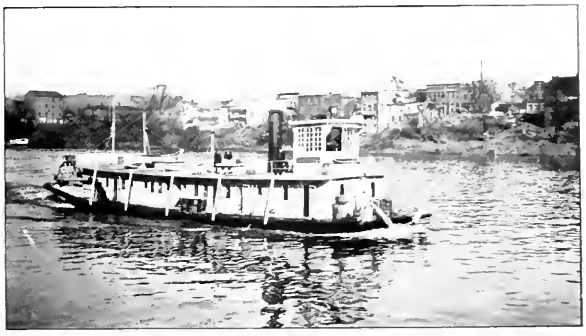
The seagoing tug John F. Craig, recently completed by the Craig Shipbuilding Company of Long Beach, held satisfactory trials in a run between Los Angeles Harbor and Catalina Island. The tug is equipped with 350 horsepower Winton diesel engines.

* * *

A new boat-building concern entered the Pacific Coast field with the establishment of the Umpqua Dredge & Construction Company at Reedsport, on the lower Umpqua River, Oregon. The concern is now operating a dredge and wil start boat-building activities with the construction of a gravel and lumber barge, 55 feet long and 14.5 feet beam, equipped with a 150 horsepower engine.

* * *

Two tugs for the Wilmington Transportation Company, Wilmington, California, are being converted from Union gas engine power to Union diesel engine power at the yards of William Muller at Wilmington. These are sisters to the Listo and the Vivo, each 63 feet long and each to have a Union 150 horsepower 4-cylinder mechanical injection diesel.



Diesel-electric shallow draft river tug J. B. Battle, built by the Charles Ward Engineering Works, at Charleston, West Virginia, for the U. S. Engineers. We shall publish full description and drawings of this boat in a forthcoming issue.

William Muller is also building a new glass-bottom boat, the Princess, for the Wilmington Transportation Company. This boat is 84 feet long, 18 feet 3 inches molded beam, 28 feet 2 inches breadth over guards, with a draft of 3 feet 9 inches. She will be equipped with two 80 horsepower Union engines.

The Union Gas Engine Company report sales and orders for a number of their diesel engines, among which are the following:

Butler & Bell of Astoria, Oregon, one 65 horsepower 3-cylinder for installation in the launch Rose to replace a Union gas engine.

Powell River Company of Vancouver, B. C., one 110 horsepower 3-cylinder for installation in new towboat being built for them by W. R. Menchions.

Lake Union Dry Dock & Machine Works, Seattle, one 65 horsepower 3-cylinder for demonstration purposes.

Rhodes-Jamieson & Company, Oakland, California, one 80 horsepower for instalation in their towboat Starlight.

The Union Gas Engine Company also reports the recent sale of nineteen gas engines for marine installation. These are of two sizes, seven and fourteen horsepower, and were shipped to various points on the Pacific Coast from Alaska to Peru.

* * *

A new venture in Pacific motorboatdom is the motor boat garage, which is now being established by Garnett B. Holmes and Frank Culver of Long Beach, Calif., to give every service now demanded by automobiles from a first-class garage.

AIR PUMPS VERSUS FEED PUMPS

Some Stunts Holding Vacuum on the Original American Marine Compound

By SEA FLAME

THE old steamship Acapulco, which ran for many years between San Francisco and Panama, was engined by a Scotch-built job. She was compound (the first compound engine in an American steamship), with cylinders of 56 inches and 84 inches with a stroke of 48 inches. (I believe these figures are correct.) She had a slide valve on the high pressure, together with a cut-off valve. The low pressure had a three-ported slide valve, and this often gave the younger chaps some study when it was pulled up for observation. All cylinders and covers were steam-jacketed, as were the bottoms of cylinders. The Acapulco was built by the Harlan & Hollingsworth Corporation in Wilmington, Delaware, in 1873. The engines were built by John Elder & Company, Glasgow, and were dated 1871. The boilers were built by Harlan & Hollingsworth.

While on this subject will further describe her engines. They were peculiar in having a material difference in the valve travel of the high and low. Also the links of the low were a full third longer than the high, with correspondingly longer rocker arms to compensate for this. Her connecting rods were very short. In fact, so much so that a first assistant engineer named Dave Zimmerman was killed by having his head jammed between the low pressure beam-link ends and the main shaft bearings, for when she was on bottom center there was but little clearance between those units.

Her reversing gear was a long screw turned by a single engine, and on this screw was a long brass nut, which in turn was attached to rocker arm of wiper shaft. It took quite an appreciable time to get her over from ahead to astern, and unless the operator was on to the way she would stick, and then it became necessary to get pressure off of backs of valves before she could be moved. The writer found it quite difficult to get the youngsters to handle her. Some of them would pick up the trick quickly. Others could never get it. In fact, in the "real old days" the first assistant was always supposed to take her in and out of port.

The writer was first assistant of her in 1893 for several voyages, and at that time she carried 60 pounds' working pressure. Many years later was appointed chief of the job, shortly after she had been raised from the bottom of the dock at Spear street, San Francisco, where she sank while being coaled. At that time her pressure had been reduced to 48 pounds, and to get any speed out of the ship it was necessary to get all the vacuum possible. Also, when running between South Coast ports on a medium speed, a conservation of vacuum was one of the factors required to ensure anything like a decent coal consumption.

At times the vacuum would drop back to 10 and 12 inches, with corresponding slowing down, and then it meant more steam to keep the revolutions. The writer was considerably worried over this somewhat curious trick of losing vacuum. All pumps were attended to carefully, valves being put in air pumps, buckets packed, and everything done to prevent the loss of steaming along for a few miles the vacuum.

It may be well here that the engines were fitted with two circulating pumps and two feed pumps, each cylinder operating one each of these by means of the usual beams and links working from crossheads. The forward air pump discharged through a 14-inch pipe to a tee at the after pump's discharge, but had a "hotwell" or suction space at the delivery valve. Also the feed pumps had plug cock shut-offs in case a repair at sea was necessary.

Well, this habit of losing vacuum was becoming a nightmare to the writer. He took it up with the assistants and asked for any possible explanation on their part. They were also stumped, though there were some bright boys among them. One night, leaving San Jose de Guatemala for Champerico, orders for revolutions to make about six knots were given. The ship was quite a bit by the stern. For a few minutes after leaving the anchorage she went fine, the vacuum being well up to 25 inches. Then it dropped, and more steam (and coal) had to be used to get the revolutions. Again the subject was pondered over. Nothing to show why was arrived at.

Brain-weary from thinking over the matter, I went to sleep and woke up about 1:30 in the morning watch. Like a flash the reason for the trouble came into mind. A quick jump to the speaking tube and the second assistant, replying to the call, was told to close the feed water suction on the after hot-well. As such a peculiar order, coming at such a time, was rather out of the ordinary, he asked that it be repeated, as he probably thought something was wrong with the "old man." On repetition he replied, "Very well, sir," and at once went to the back of the engines to carry out the order.

The writer, shoving on a pair of slippers, made for the engine room. He had not reached the working platform before "Old Betsey" began to grind away at a great rate, and the second was busy closing in the throttle to hold the turns back to orders when I reached the station. "She's got her vacuum good, sir," he cried, and so she had. "And I think she will keep it too," was my answer, "and all due to closing the feed off the after pump." To this the second looked skeptical, so an explanation was made, and he saw the cause of the loss of vacuum, and by removing the cause, its remedy.

It must be remembered that the ship was by the stern. That she had two air pumps, one taking from forward part of condenser, the other from aft. Also two feed pumps, each taking its water from a recess near the head or delivery valve of its air pump. So it followed that if only a slow speed was being run, all, or nearly all, the water of condensation would be flowing to the after air pump, leaving the forward one dry, with no "water seal" for its valves or bucket. By closing the after feed pump suction, the condensate was bound to flow along the connecting pipe from the forward air pump and flood its head valve in order to fill the recess there, so that the forward feed pump could get in its work. This was the correct solution, and from that on we had no vacuum troubles with the old girl. It was one of those baffling cases where only a complete and close reasoning as to "why" the cause could the effect be found.

Another thing we had to do to the engines was to run high pressure steam from the high pressure valve case to the low pressure by-pass valve. When first

(Continued on page 127)

BOOK REVIEWS

STAR GAZING

"Hitch your wagon to a star,
Hang on tight, and there you are."

FROM time immemorial men have been following stars. Gazing into that "spacious firmament," which still to questing human hearts "declares the glory of God," men have sought in all ages to unravel the wonder of that great heart response which they feel but do not understand.

In all ages men following their thoughts skyward have made great discoveries. Three wise men from the East led by His star found the Savior of the World.

Some Norse Viking following a star discovered a new continent; Columbus later following another star rediscovered the same continent. Why multiply instances? The proverb will suffice—"Westward the Star of Empire."

In the heart of every human child lies this lure of the stars. Properly guided it leads the child to great adventures of the mind, broadens the horizon of the imagination, bridges the gap between the finite and the infinite.

Civilized man is prone to scoff at the value of this kind of training which is treasured by nearly all primitive peoples and which should never be discarded by the most advanced systems of education, because every child at heart is primitive. In the African jungle, on the Eskimo's ice floe, on the coral atoll of the Polynesian, primitive man is still teaching his children the wisdom of the stars, and the routine of seasonal occupation is fixed by the stellar calendar.

Civilized man for at least two generations has been unable to do this because of his own mental limitations. With the exception of the comparatively few who have devoted their lives to astronomy or navigation, knowledge of the universe is chiefly wrapped up in a limited stock of phrases describing the conditions of the moon, the north pole star, the big dipper.

Time was in the youth of the American Commonwealth when the young men of the Thirteen States did much star gazing and many of them following stars did carry the Stars and Stripes to every corner of the earth, adding many glorious chapters to our nation's history. All they asked was "a tall ship and a star to steer her by" and they owned the earth.

Perhaps a renewal of star gazing by our school children will mean a great increase in the shipmindedness of American leadership in the coming generation.

This thought leads us to commend for the use of our readers two books recently written by Gaylord Johnson, an American astronomer. These books, "The Star People" and "The Sky Movies," narrate the adventures in star gazing of the astronomer and the three children of his sister, during which, with the assistance of very simple devices and a few fairies, the children demonstrate to themselves the movements and the positions of the heavenly bodies. These books are authoritative, interesting, and calculated to develop constructive imagination not only in children but also in parents.

The Star People; The Sky Movies, by Gaylord Johnson. Two volumes, 175 pages each, with numerous illustrations and diagrams; bound in blue buckram with white stampings; published by The MacMillan Company, New York.

The Pirates of the New England Coast, 1630-1730, by George Francis Dow and John Henry Edmonds, with an introduction by Captain Ernest H. Pentecost. Large octavo, 47 illustrations, 416 pages, bound in red buckram with gold stampings; published by The Marine Research Society, Salem, Massachusetts. $7.50 net.

This is publication number two of The Marine Research Society and, as in the case of number one, "The Sailing Ships of New England," a number of copies, eighty-five in fact, were specially printed on large paper. Like number one, it is rapidly being sold out and may already be exhausted so far as direct purchase is concerned.

George Francis Dow is curator of the Society for the Preservation of New England Antiquities and John Henry Edmonds is Massachusetts State Archivist. The book is compiled largely from official records of the trials of Pirates and from Captain Charles Johnson's "History of the Pirates." So it is full from end to end of "Pyrats" of every description.

In the first chapter the reader is introduced to Peter the Great and the "Brethren of the Coast"; those choice buccaneers of the Spanish Main who made sea life interesting in the seventeenth century.

Then we meet Thomas Pound, who tried piracy for a short spell but lived to be captain of a king's frigate and died like a good retired gentleman in his bed at home at Isleworth, Massachusetts. Captain Kidd of evil fame is proved to be as innocent a privateersman as was ever hung for a pirate. Thomas Tew, an interesting New England genius, first turns pirate but takes his activities to the other side of the world and uses his piratical ventures as a crutch with which to make very profitable connection in supplying as a merchantman the pirate colony at Madagascar. Had Thomas lived today he no doubt would have been a financial genius of the first water.

One Ned Low also received considerable attention This worthy had a genial habit of tying his victims to the mast, trimming their ears off, frying said ears and feeding them to the victim. This brute's last ship was the "Merry Christmas," in which his crew rose against him and abandoned him in an open boat.

All these and many more strange tales of the sea robbers are told in great detail and with a pleasing narrative style that makes easy reading. For mild winter cruising before a roaring wood fire we can recommend this work most heartily.

AIR PUMPS VERSUS FEED PUMPS

(Continued from page 126)

built the steam through by-pass valve on low pressure was taken from the steam jacket. At that time about 10 to 12 pounds was carried. With the lowering or boiler pressure sufficient steam could not pass through the 1-inch pipe to pull the low pressure piston up when high pressure was on center. So we blocked off the old 1-inch entrance, drilled and tapped a 2-inch pipe hole in the by-pass valve cover, and led the line around to the high pressure, taking steam from the valve chest. This did the trick.

But the Acapulco is gone now. Her engines and boilers have been scrapped. Her hull was demeaned to barge purposes. Most of her old-time crew have sailed their last voyage.

PACIFIC MARINE REVIEW'S BROADCAST STATION ·P·M·R·

E. E. Anderson has been appointed city passenger agent at Portland for the Admiral Line, according to announcement by **T. B. Watson,** general agent for the line in that city. At the time of Mr. Anderson's appointment, **William L. Oxley** was advanced to the position of city ticket agent. Mr. Anderson has served the Admiral Line five years, and Mr. Oxley, two years.

✣

H. F. Alexander, president of the Admiral Line, recently in San Francisco, looks to 1924 being a record year in the history of Pacific coastwise passenger traffic. Mr. Alexander reports that the reconditioning of the steamers H. F. Alexander and Emma Alexander, formerly the Nanking, is progressing satisfactorily in the plant of the Todd Shipbuilding & Drydock Company at Puget Sound. The Emma Alexander is expected to be ready for service the first week in February and the H. F. Alexander by early March. The Emma Alexander will operate opposite the Ruth Alexander between Seattle, San Francisco and Los Angeles, while the H. F. Alexander will have an independent schedule over the same route.

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General George Uhler, supervising inspector general of the Steamboat Inspection Service, has submitted the annual report on ocean travel for the fiscal year ending June 30, 1923, and the figures show that safety for water transportation is reaching higher degrees toward perfection.

The report presented to Congress shows an unusually heavy traffic in passengers for the fiscal year with but a small number of casualties. The table shows that 323,130,362 passengers were carried on vessels required by marine regulations to make report of the number of passengers. Of this number but 197 figured in accidents, 59 passengers were lost, and that the ratio of safe travel was 5,476,785 to 1. The number of lives directly saved by means of the life-saving appliances required by law was 907. The statistics bear out the assertion that travel by water is as safe as by land.

✣

The British Columbia Shipping Federation has elected officers for 1924:

F. W. Peters, Canadian Pacific Railway, president.

Captain W. M. Crawford, Empire Stevedore Company, first vice-president.

Captain E. Beetham, Canadian Pacific Steamships, second vice-president.

Executive Committee:

J. C. Irons, Canadian-Australian Line.

K. J. Burns, Canadian Robert Dollar Company.,

B. C. Keeley, Canadian Government Merchant Marine.

B. W. Greer.

Lieutenant Colonel W. Foster.

✣

Captain Peter Johnson, commodore of the Matson fleet operating between San Francisco and Hawaii, and commander of the flagship Maui, on January 9 began his thirty-sixth year of service with the Matson organization. **Captain John O. Youngren,** master of the steamer Enterprise, is in his thirty-third year under the Matson flag. Captain Youngren has made 217 voyages in the good ship Enterprise.

✣

"Metal Mike," one of the famous Sperry children, now holds the helm of the Standard Oil tanker R. J. Hanna. This is the first installation on the Standard Oil tanker fleet. Other vessels soon are to be equipped with this wonderful automatic steering apparatus. "Metal Mike" is hanging up a stellar record for valuable and efficient service.

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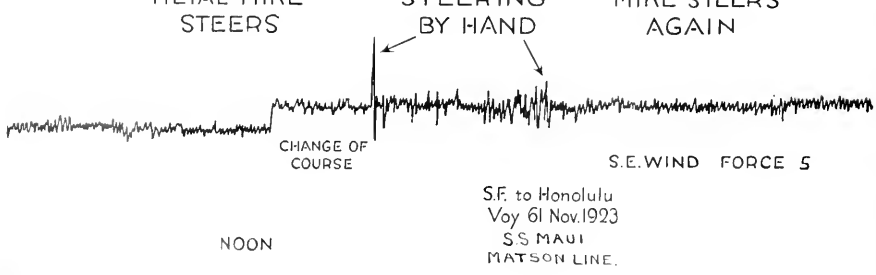
Hugh Mackenzie, general passenger agent of the round-the-world service of the Dollar Steamship Line, recently appointed **George G. Neil** as passenger agent for the company at Los Angeles.

Ronald M. De Long was named for the position of Los Angeles tick-



One of "Metal Mike's" records on the steamer Maui

et agent. Mr. Neil was with the Canadian Pacific Railway for several years and during the World War was an U. S. naval officer overseas. Mr. De Long was formerly with the American Express Company.

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R. Stanley Dollar, vice-president of the Dollar Steamship Line, on January 16 took formal delivery of the steamer President Hayes at San Francisco from **F. W. Relyea,** district director of the United States Shipping Board. Mr. Dollar left San Francisco January 16 for New York, where he will participate in the ceremony of the initial sailing of the steamer President Adams from that port on February 7. The Dollar Steamship Line's general passenger offices have been opened in the second floor of the Robert Dollar building, 311 California street, San Francisco, and are handsomely appointed and attractive.

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Port Manager Peters, of the Grays Harbor port terminal, which was completed in September, 1922, announces that the new terminal was used in loading more than 10 per cent of all Grays Harbor's 880,000,000 feet of lumber shipped by water in 1923. The port dock handled shipments from mills in all sections of the county. The terminal shipped 96,032,724 feet of lumber in 1923, and more than 113,000,000 feet since the opening sixteen months ago. A program of bar improvement and navigation aids is now being asked of the Federal government.

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W. D. Motts, secretary of the Alaska Packers' Association, in a statement to stockholders, expresses confidence that the 1924 markets would resume a prewar character, although the continued financial and industrial disturbances of Europe still have detrimental effects. However, the European condition would be felt in a lesser degree, it is predicted. The following pack was made during 1923 at the association's thirteen canneries in Alaska and one at Puget Sound: 8068 cases of sockeye, 602,672 cases of red, 3946 cases of king, 8231 cases of coho, 112,600 cases of pink and 13,848 cases of chum, totaling 743,965 cases.

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H. E. Stocker, general freight agent of the Pacific Mail Steamship Company in charge of the intercoastal service, announces that the company offers a 25 per cent discount on freight of samples consigned by exhibitors to the First International Sample Fair to be held in Havana from February 9 to 24. Mr. Stocker recently was transferred to the Pacific Mail headquarters at San Francisco after serving in New York for several years as assistant general freight agent.

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R. J. Chandler, general manager of the Los Angeles Steamship Company, announces that **S. Lindo,** formerly port engineer of the line at Los Angeles, has been promoted to the position of marine superintendent. Mr. Lindo, who for a number of years served as port engineer, now has charge of all Los Angeles Steamship Company vessels in both the coastwise and Hawaiian services.

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Thomas G. Plant, operating manager of the American-Hawaiian Steamship Company, recently prepared a summary report covering eighteen months' operation of the motorships Californian and Missourian which shows the remarkable features of the diesel drive as compared with steam propulsion. Compared with the average steamer of the same tonnage and running under th same conditions, the motorships not only proved speedier but operated at a greatly reduced cost of fuel consumption, according to the report. The Californian and Missourian are 461.7½ feet long, with a beam of 59.8 feet, load displacement of 11,450 tons, with 4500 I.H.P.

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A. M. Garland is now in charge of the chartering department of the General Steamship Corporation, succeeding **George H. Reily,** resigned. Mr. Garland is a widely known official in Pacific Ocean shipping. Among the responsible positions he held in the past was that of general passenger traffic manager of the old Pacific Mail Steamship Company, and later general manager of the China Mail Steamship Company.

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Dollar Steamship Line's dock offices for the round-the-world freight and passenger service are now complete at Pier 42, San Francisco. One set of offices will be used as freight headquarters, and on the other side of the entrance are rooms for the operating department. The steamer President Hayes departs from San Francisco on February 2, being the second sailing in the globe-circling route. The President Adams leaves New York February 7 as the first sailing in the new service from the east coast, and is due at San Francisco February 28. She starts for Honolulu and the Orient and onward round the world on March 1. Departures will be maintained every two weeks.

Captain W. J. Stofen, formerly master of the coastwise steamer Cuba of the New Electra Line, who recently joined the staff of the General Steamship Corporation, has been appointed marine superintendent for that company at Seattle.

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The Munson Steamship Line, according to dispatches, will increase its capitalization from $4,000,000 to $6,000,000 by means of an issue of $2,000,000 worth of preferred stock.

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W. A. Young, Jr., general passenger agent of the Pacific Mail Steamship Company, announces that low one-way and round-trip fares to Havana will be allowed to enable tourists to attend the Mardi Gras in February and early March, when the Cuban season for tourists is at its height. Proportionate rates will be allowed passengers desiring to continue on the New York.

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A. T. B. Shiels, marine surveyor, consulting engineer and northwest representative of the Bethlehem Shipbuilding Corporation and the Steward Davit & Equipment Company, with headquarters at Seattle, has been appointed northwest agent for the Federal Composition & Paint Company of New York. **A. L. Becker** of San Francisco completed the arrangements for Mr. Shiels to take over the territory.

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Captain Harry Ramwell, head of the American Towboat Company of Everett, Washington, was recently reelected president of the Northwestern Towboat Owners' Association, at an annual banquet held in Seattle. The meeting was attended by towboat owners from all leading Puget Sound ports. **H. O. Foss** of the Foss Launch & Towboat Company of Tacoma was elected first vice-president, and **George R. Cary** of the Cary-Davis Tug & Barge Company was chosen second vice-president. **W. T. Isted** of Seattle was reelected secretary. It was announced that Mr. Isted had been selected by the Rivers and Harbors Association of Washington, D. C., to represent the Pacific Coast at the capital in regard to matters of rivers and harbors legislation.

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T. G. Maddox is now assistant general freight agent of the Luckenbach Steamship Company with offices in Los Angeles, according to announcement by **Captain Paul Chandler,** district manager for the line. The appointment of Mr. Maddox was made to meet the increased traffic needs of Southern California and

the attendant necessity for a resident general officer of the traffic department. For ten years Mr. Maddox was in the service of the Santa Fe Railroad in Missouri and since 1907 has been engaged in transportation in Los Angeles.

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H. N. Fletcher, vice-president and general manager of the **W. & A. Fletcher Company** of Hoboken, New Jersey, accompanied by Mrs. Fletcher, arrived in San Francisco recently for a tour of the Pacific Coast. Mr. Fletcher was one of the founders of the W. & A. Fletcher Company, a widely known ship repair and turbine construction firm. The company was established in 1853 and today has a great plant and organization for marine work. Mr. and Mrs. Fletcher made the Panama Canal trip to California on the Panama Pacific liner Finland.

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Walter S. McPherson, who was connected with the Los Angeles office of the American-Hawaiian Steamship Company before the war, and who has been the Los Angeles resident partner of McCormick, McPherson & Lapham, has been appointed Los Angeles agent for the American-Hawaiian Steamship Company. The firm of McCormick, McPherson & Lapham have relinquished the agency and the American-Hawaiian now maintains its own office and staff at Los Angeles. Mr. McPherson has associated with him many of the employes who have in the past been handling American-Hawaiian affairs for McCormick, McPherson & Lapham. The new offices, in charge of Mr. McPherson, are in the Central building, 108 West Sixth street.

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Yonejiro Ito, chairman of the board of directors of **Nippon Yusen Kaisha,** in the sixty-seventh report at the half-yearly general meeting of shareholders, dated November 29, 1923, showing the assets and liabilities of the firm for the year ending September 30, 1923, shows the net profit, after providing for the depreciation of the fleet, insurance and ships' structural repair funds, to be yen 1,424,694, including yen 310,768 brought forward from the last account. Adding thereto yen 2,000,000, the amount transferred from the dividend equilization fund, the company obtains a total surplus of yen 3,424,694. The N. Y. K. fleet is comprised of 85 steamers, 3 additional steamers building, and 44 steam launches and tugs. The fleet total gross tonnage is 532,881.

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Deaths

Charles D. Bowles, former vice-president of the Columbia River Shipbuilding Corporation, died at his home in Portland, Oregon, on January 10. Born in Vancouver, sixty years ago, Mr. Bowles had long been identified with the legal profession and business life of the Pacific Northwest. For a number of years he practiced law in Vancouver. From that city he moved to Seattle, where he became president of the Bowles Company, wholesale dealers in iron, steel and plumbing supplies. He was interested in the shipbuilding firm of J. F. Duthie & Company in Seattle. Later he became vice-president of the Northwest Steel Company and vice-president of the Columbia River Shipbuilding Corporation. Mr. Bowles is survived by his widow and four sons.

Booth of the Scovill Manufacturing Co. at the Marine Exposition, showing many products in brass, steel, and aluminum

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Captain George A. Crockett, aged 63, veteran master mariner and Alaskan pilot, died January 14 in Seattle, his home, after a two weeks' illness. Captain Crockett for many years was in vessels of the old Pacific Coast Steamship Company and its successor, the Pacific Steamship Company. He was born in Vinal Haven, Maine, in 1861. His first seafaring experience was in a fishing vessel operated by his father on the coast of Maine. Captain Crockett has a brother, Captain E. E. Crockett, master of the steamer Redondo of the Alaska Steamship Company.

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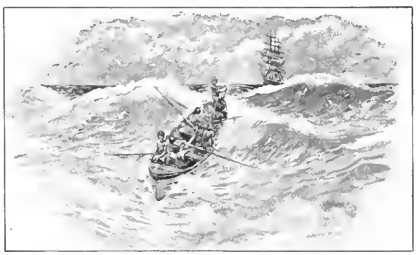
Edward S. Hough, widely known consulting engineer, naval architect and marine surveyor, with offices at 16 California street, San Francisco, passed away January 1 as the result of a sudden heart attack. Mr. Hough, whose home was in Oakland, was 63 years old. He gained prominence during the World War for his work with the Emergency Fleet Corporation. The government accepted the Hough system of ship construction and from this plan several hundred cargo vessels were built in yards throughout the United States. Born in England, Mr. Hough came to America at an early age. He was a thirty-second degree Mason. Surviving Mr. Hough are his widow, two sons, Edward S. Hough, Jr., and Arthur Hough, and a daughter, Anita, a student at Mills College.



PACIFIC MARINE REVIEW'S THE MONTH IN MARINE INSURANCE

THE MONTH'S DEVELOPMENTS ON THE PACIFIC COAST

By FRANCIS ADRION, Contributing Editor

ALBERT ULLMANN, prominent New York marine underwriter, visited San Francisco during January. Mr. Ullmann is the United States marine underwriter for the powerful group of companies consisting of the North British & Mercantile Insurance Company, Ltd., the Commonwealth Insurance Company of New York, the Mercantile Insurance Company of America, and the Pennsylvania Fire Insurance Company.

Mr. Ullman has spent several months making a survey of marine conditions throughout the United States and was very favorably impressed with the local marine fraternity. While he was not optimistic over the general outlook, Mr. Ullman's observations indicate an era of improved underwriting conditions in the making. Like all other well informed marine underwriters, Mr. Ullcan considers that companies have greatly undervalued their stock in trade, and he found this state of mind prevalent throughout his trip. Mr. Ullman frankly predicts a general upward trend of rates and points to this as absolute necessity. If this can be brought about in no other way, it will, according to Mr. Ullman, be accomplished through a narrowed competition caused by the withdrawal of companies that cannot or will not continue under present conditions.

Mr. Ullman is of the opinion that 1923 figures will show that companies, for the most part, made a poor showing in their marine account, and looks for a continued heavy loss ratio in 1924 unless a very material revision in rates be realized.

While in San Francisco Mr. Ullman made his headquarters with Parrott & Company, Pacific Coast marine agents for the North British & Mercantile, and before returning to New York visited the various agencies of the company located on the Pacific Coast.

Rumored Consolidation

An unconfirmed rumor has been making the rounds to the effect that Johnson & Higgins and Willcox, Peck & Hughes are figuring on consolidating. In view of the large interests of these two prominent brokerage firms, an unusual amount of chatter has been passed over the rumored combine.

I was talking to a certain member of the staff of one of these firms and he considered the idea to be rather amusing. He likened the thought of any such amalgamation to that great peace that descended upon the earth after a great conflict wherein "The lion layeth down with the lamb." I have pondered quite a bit since over his idea. In fact, I consider the simile drawn to have all the earmarks of a good one. I cannot, however, for the life of me decide which is the lion and which is the lamb. Should this consolidation be effected, I have no doubt that this point will be emphasized to my complete edification.

Agents' Licenses

A letter has been directed by George D. Squires, insurance commissioner, to all companies operating in California relative to the issuance of agents' licenses. The letter follows:

"Recently it has come to the attention of this department that persons have applied to this department through various insurance companies for the issuance of agents' licenses, it being the desire of such persons to secure such licenses solely for the purpose of insuring their own property. Notwithstanding this fact, such so-called "agents" have made a sworn statement to this department in their application to the effect that they are not actuated principally in applying for such licenses by the prospect of insuring their own property. Following the issuance of agents' licenses to these parties, they have applied for insurance covering their own property and received as a commission a part of the premium shown on the face of the policy.

"Under the provisions of section 633b of the Political Code (known as the 'Anti-Rebate Law') enacted at the recent session of the legislature, the payment of commissions in such cases constitutes a rebate and the person receiving same is glilty of a misdemeanor, punishable, upon conviction, by a fine of three times the amount of such rebate, or imprisonment in the county jail for a period not exceeding thirty days, or both.

"Your attention is also called to the fact that the new law providing for the issuance of agents' licenses requires a statement from the insurance company to the effect that the applicant has a reasonable knowledge of the insurance business, and that he intends to engage steadily in the occupation of an insurance agent.

"In view of the facts above set

forth, in making application for licenses for persons to act as agents for your company, you are hereby requested to see that the provisions of the law are complied with."

A provision in the law above referred to makes it necessary for all agents who were licensed prior to August 17, 1923, to qualify under the new law. As all licenses expire on July 1, this means that all renewals will be affected. A new form of "Application for Agent's License" has been formulated, the makeup of which will undoubtedly tend to weed out the undesirables. The new form is of a delicate blush color, quite in keeping with the personal questions the applicant is asked. I will hazard a guess that a great number of so-called "agents" now holding licenses for the sole purpose of securing a commission on their own or their firm's business will decide, after one look at this form, that they do not care to apply for renewals. If one would read between the lines on the old form, the intent is practically the same, but the pertinent questions calculated to divulge the real status of the applicant were notably absent. This, however, is all changed. The law evader must now resort to definite falsehoods to accomplish what, heretofore, was merely a matter of evasion.

Insurance Syndicate

Subscribers to Syndicate "C" of the American Marine Insurance Syndicate have been notified that in accordance with a recent amendment to the Articles of Agreement, the syndicates would, on January 14, 1924, commence taking and/or writing insurance on hull interests. This move on the part of the syndicate is a new departure. The fact that this organization is about to delve into this low rate commodity in pursuit of profit comes rather as a surprise.

It would seem that syndicate members who have a penchant for this class of risk and who have heretofore written it freely, using their own judgment as to the rate offered, will now be forced to pass where the syndicate rating fails to compare favorably with that obtainable in London. Moreover, these same underwriters would ordinarily write very much larger lines on these total loss interests than their syndicate subscription amounts on hull. The difference will now go to syndicate members, who perhaps have not had the opportunity of writing these interests, by reason of a lack of offerings.

Prominent Marine Underwriter Retires

From London comes the news that A. H. Roberts, underwriter for the Indemnity Mutual Marine since 1912, has announced his retirement. Mr. Roberts is recognized as an authority on marine matters throughout the world and his withdrawal is to be keenly regretted. His retirement from active service has been caused by failing health, but it is stated that he will continue to act in an advisory capacity to the Northern Assurance Company, which company owns the Indemnity. In 1917 the Indemnity Mutual Marine's premium income was £3,290,000, which is considered to be the largest amount ever written by one company.

World Fire & Marine

Organization of the World Fire & Marine Insurance Company has now been completed by the officials of the Aetna Insurance Company. The company was incorporated in 1921, and has a paid-up capital of $1,000,000, with a surplus of equal amount. While this new company will be operated as a separate institution, its real purpose is to increase the agency facilities of the Aetna. It is improbable that the World will enter the marine field at this time. This is borne out by the fact that the Aetna discontinued the writing of marine business in 1922.

Slim Pickings

The recent smash on San Francisco Bay between the two new Key Route ferries, the Hayward and San Leandro, recalls to mind the placing of these vessels in London under a full form policy at the starvation rate of $1^3/_4$ per cent. The damage resulting from this collision was not serious, but it would not take many such to eat up the small premium charged. Compared with the tule fog that enveloped the bay on that particular morning, the famed London fogs must needs take a back seat.

New Agency

On January 15, announcement was made of the establishment at Atlanta, Georgia, of a southern branch of the Atlantic marine department of the Fireman's Fund Insurance Company and the Home Fire & Marine Insurance Company. It was stated that the new office would be managed by W. Stanley Pearce, who has been identified with the Atlantic marine department of the companies for the past several years.

Developments of the Month on the Atlantic Coast

CHARLES F. HOWELL, Contributing Editor

WITH very few exceptions, American marine insurance offices pronounce their 1923 experience as decidedly poor. Indeed, this is applicable to marine insurance last year, in whatever country practiced. The losses were comparatively light—not so much as in 1922, but considerably below the average over a series of years—but the rates have been cut to such a point as to put an underwriting profit beyond the possibilities of most offices. This is true as regards both hull and cargo. In addition to the pressure arising from the exporting of business by brokers to the demoralized markets of London and the Continent, there has been an evil influence here at home in the presence and activity of large companies and groups of companies, some old in the business and some new to it, which have been sternly resolved upon securing premium volume without regard to the adequacy of the rates that brought it. This has had a most disturbing influence and has inclined the more conservative, even against their better judgment, to join in reducing the level of rates to a point where the making of a profit on 1923 accounts will be more good luck than anything else.

It is felt by many that we shall have to have a number of major casualties before underwriters are shocked into a right angle on their business, and before the inexperienced are driven out of it. One great trouble at the present time is that our marine insurance facilities exceed the demand. Low rates are very likely to continue, as long as brokers are not complaining of the difficulty of placing accounts. These latter gentlemen have entirely too many avenues at their disposal for the placing of marine insurance, to be bothered with the pleas of underwriters here in America for higher rates. Before a really good year in marine underwriting can come there must be an improvement in international commerce, a contraction in marine facilities, and adequate rates.

Would Reduce Sea Risks

Numerous interesting discussions marked the recent meeting of the Marine Committee of the National Fire Protection Association at New York, and it became apparent that every angle of the question of sea perils is being given serious and expert consideration. Mr. S. D. McComb, the well known marine underwriter, presided, and in addition to the presence of a number of the committee there were in attendance representatives of the United States Salvage Association, the Board of Marine Underwriters, and New York City officials. The general theme of interest, of course, was the reduction of hazards to cargo and vessels by means of an improvement in the construction and equipment of ships, along with thorough precautions against dangerous shipments. The committee adopted plans for the accomplishment of these purposes, and these proposals are to be submitted to marine underwriters, ship builders and ship owners for constructive criticism.

A sub-committee reported on methods for reducing to a minimum fires on ships. It was pointed out that the number of accidents due to explosions in oil tanks has been greatly reduced since the adoption of the committee's report on the safe and adequate cleaning of tanks. Proposals for the use of non-inflammable materials in the superstructure of ships, the adoption of better fire alarm systems, and improved electric light installations, were made and approved. The committee is now engaged upon the drawing up of a code of hazardous cargoes, for the use of underwriters, and it is confidently expected that this is going to place the protection against this element of danger upon an advanced scientific basis. Furthermore, it was suggested that the marine underwriters' laboratories carry on extensive experiments on oil fuel in order to determine whether oil of a flash point lower than 150 degrees, as at present used, may be utilized with safety. J. G. Gillespie delivered an address on fire prevention devices in hotels; it is claimed that many of these inventions are no less applicable to use aboard ships.

Insuring German Scrap-Iron Ships

The year-end was signalized by the offering in the New York marine insurance market of a decidedly unusual and possibly highly interesting line of coverage. This con-

PACIFIC MARINE REVIEW'S
MARINE INSURANCE DIRECTORY

sisted of the insurance on several old steamers that are bound for Germany to be broken up for the old iron that is in them, according to general reports, although there are not a few skeptics who are in doubt as to whether or not this is just another shrewd Teutonic trick and that the vessels are destined for other uses. Be that as it may, the underwriters had to be talked into taking the business, because the ships are to cross the Atlantic with full cargoes of coal, and as some of them are old and of the type that is equipped with large side-ports for handling coastwise cargo, the insurers regarded them as poor risks for full cargoes transatlantic in winter.

Among the steamers alleged to be bound for the scrapheaps of Germany are many of the United States Shipping Board boats that have been tied up in the Hudson River since the war. They are to be towed to a New York drydock for repairs prior to the ocean passage. After the same fashion must be considered the El Paso and the El Monte, of the Southern Pacific, which have been sold to German interests for the same reported purpose. They sailed from New York for Norfolk, just before the closing of the year, and took on full cargoes of coal for discharge at Rouen, France, whence they are to proceed to Germany to be broken up. These two vessels are thirty-eight years old.

Mexican Beans Spilled Again

All sorts of shipping and underwriting complications are growing out of the revolution in Mexico, which everyone, a few weeks ago, thought would last but a brief day or so, but which still continues to hang together and wear a formidable look. At Vera Cruz, which the rebels control absolutely, duties are enforced against goods and shipping and fines are imposed, and when a ship clears from there and goes up to Tampico for additional cargo she is pounced upon by the Federals, who control that port, and new clearance charges and still further fining become the order of the day. This was the case with the Ward liner Esperanza, and it will take a Philadelphia lawyer to clear up the tangle. The vessel's owners paid the rebel charges as the quickest way of getting out; but they were fully aware that they were not satisfying the customs laws of the Mexican government, but they thought to pass the charge on to the cargo owners. These latter are trying to pass the buck, as nimbly as may be, to the underwriters; and the underwriters are figuring out how much they will have to pay.

Theft and pilferage hazards are greatly increased at Vera Cruz due to congestion there resultant from delay in handling cargo and vessels because of the activity of the revolutionists. For some time no further shipments have been consigned to that port, but nevertheless there continues to be a substantial demand for theft and pilferage cover on the part of those merchants who had already sent their goods to Vera Cruz without such protection and now are wondering just where they stand, their merchandise having been discharged and lying unguarded on the wharves.

While on the subject of theft and pilferage it may be noted that Chile is in the way of spoiling her fine record in this respect, if the strike of organized longshoremen at Iquique continues and congestion results. Taken the world over, last year saw decided improvements as regards theft and pilferage outrages. This was partly due, no doubt, to more efficient supervision and safeguarding, and partly to the invention and use of improved containers and packing devices. The campaign will be continued, the world 'round, in 1924.

PACIFIC MARINE REVIEW'S
MARINE INSURANCE DIRECTORY

Reverting to the Mexican situation, New York cotton underwriters withdrew their rates before the year closed, and advised that in the future they would cover shipments to Mexico subject to a specific rating in each case. A large portion of cotton shipments are routed all rail via El Paso. In general, merchants doing business with Mexico have sought "revolution" cover since the outbreak of hostilities, and the underwriters have been asking from three to five per cent for it. The ordinary war risk covers are limited to risks at sea and do not apply on land. Likewise, the unusual strike and riot covers do not include revolution; thus it has become necessary for those who want it to pay the high rates or forego the protection. Those merchants who are so fortunate as to have a strike and riot cover in their policies, with a provision including revolutions, will be protected at the policy rate until expiration of the time limit provided by the policy for notification of change in rates.

Canada May Strike Back

There is continued discussion of just what, if anything, the Canadian Government is going to do with respect to making good its hints of setting up in the marine insurance business on its own account unless British underwriters abate their alleged discrimination against British North America. No new developments of consequence have been reported from Dominion headquarters during the past few weeks, and it is possible that the whole affair may peter out into nothing. That is the belief of the British underwriters, at least. They look upon Canada's threats as "old stuff," and think nothing will come of it. They admit the improvements in navigation aids in Canadian waters, but insist nevertheless that nothing so far discovered has proven adequate to eradicate the danger of ice, fog and storm, which add so much to the perils of trading with Canada in certain seasons of the year. The protest of the Dominion is regarded in London as ill-timed, particluarly when one recalls such losses in Canadian waters this year as that of the Marvale near Cape Pine, the Frontpool, the Advance, and a formidable series of expensive casualties.

French "Licensed Brokers" Doomed

To underwriters of other than French nationality, and possibly to many of the latter, the special privileges of "licensed brokers" in France have long appeared to be incongruous and inconsistent. Only a few old established firms at the present time have marine insurance licenses in France. Nor has the French market found the system to work out as an unqualified blessing, particularly as shippers and merchants have been able to deal directly with foreign companies without legal difficulties. Now comes the interesting announcement that the "courtier jure" is to be abolished. It is a survivor of the Napoleonic Code. By the terms of a bill now before the Chamber of Deputies any Frenchman who may so desire may engage in marine insurance brokerage work six months after the measure is enacted.

Insuring the Taint in Flour

News comes from England to the effect that shipowners over there are preparing to rid themselves of liability for "taint" in flour cargoes, and underwriters here as well as there forsee that should this eventuate they will be compelled to overhaul the "all risks" clause under which flour is sometimes insured. This clause covers practically all damage, including taint, but in the past first recourse in taint claims has been to the carriers, as is properly equitable, because in the majority of instances taint arises from careless or improper stowage. Should liability for taint be excluded from bills of lading, underwriters would be asked to pay, both under the main terms of the clause and under that part of it which reads: "Including risks of negligence excepted in bills of lading."

Broken Rafts in the Baltic

Underwriters are disturbed over the frequent breaking up of immense rafts of timber in the Baltic Sea, a casualty of many-sided hazards and one of which there have been numerous examples during the recent heavy storms in that locale. One huge raft of 130,000 cubic feet of timber was so riven to pieces as to lose fully one-half. What that means to other vessels following in her course is obvious. Dangers to navigation are greatly increased thereby. There is a growing unanimity in the opinion that such rafts ought to be forbidden under certain circumstances. It is insisted that they should be subjected to close inspection as regards fastenings, and that they ought to be towed for but short distances. To salve this floating timber will be a most difficult undertaking, and unless something of this kind is done underwriters must await, with what courage they can muster, the effect upon other vessels voyaging in the Baltic.

Eastern Offices

The old Insurance Company of the State of Pennsylvania is taking up the business of inland marine insurance, and will write the following classes: Trip and annual transit by rail, auto truck, steamer, theatrical floater, horse and wagon floater, tourist floater, personal effects floater, and parcel post.

Better packing for export by parcel post is being urged, not only as regards goods for domestic forwarding but, to an even greater degree, with respect to parcels destined to foreign countries, because of the additional handling in foreign customs, the increased transportation hazards, and climatic conditions abroad which often damage goods.

THE SHIPBUILDING OUTLOOK

By J. HARRY MULL,
President and General Manager of the Wm. Cramp & Sons Ship and Engine Building Company

WITH Congress actively considering legislation necessary for the upbuilding of the American merchant marine, the possibility that funds under the control of the Shipping Board will be made available for conversion purposes as well as for new construction, prospects that the coastwise laws may be extended to the Philippines and the President of the United States taking steps looking towards a settlement of the world's commercial affairs, the shipping outlook for 1924 is more promising than for some time past, with every indication that the shipbuilding industry will share in the improved conditions that can be expected.

The depression in foreign trade and the placing upon the market of a large number of freight vessels by the Shipping Board has prevented the shipyards from receiving orders for the building of freight vessels. The small amount of new ship construction during the year just closed can be attributed to these underlying causes, the principal of which, however, is the depression in foreign trade, for it is from commerce that the shipyard must look for the demand for vessels. There must be freight to be carried exceeding the capacity of the existing freight carries before there is a demand for new vessels. Therefore, the shipbuilding industry is the last to feel any benefit from an increase in commerce, which must be built up beyond the point where the existing vessels can take care of the increase in freight before new ships are required.

There are several vessels under consideration for passenger and freight traffic which may be built in the coming year, provided satisfactory arrangements can be made with the United States Shipping Board for utilizing the provisions of the Merchant Marine Act of 1920, wherein one-third of the cost of new construction is provided for out of funds under the control of the board.

The most cheering feature of the coming year, insofar as shipbuilding is concerned, is the fact that President Coolidge has taken steps looking toward a settlement of the world's commercial affairs. If the conditions in Europe are brought to a reasonable solution, there is no doubt but that foreign trade will benefit greatly. Wise legislation on the part of Congress should result in the United States merchant marine obtaining its share of this increased trade, and, therefore, the shipbuilder should also benefit by the demand for cargo carriers.

On the whole, the outlook for 1924 is more encouraging than for the year past and wise legislation on the part of Congress, which is absolutely essential for the success of the American merchant marine, and the extension of the coastwise laws to the Philippine Islands, should be encouraged and insisted upon by all those interested in the upbuilding of the American merchant marine.

IN PACIFIC COAST SHIPYARDS

SHIP REPAIRING
SHIP BUILDING
RECONDITIONING
ENGINE REPAIRS

Work in Prospect

Congress has been requested by the Navy Department for an appropriation for the construction of a flotilla of light-draft gunboats to replace the seven small gunboats which are now doing patrol work in the Yangtze River. The Twelfth Naval District, located at San Francisco, announced that the Union Plant of the Bethlehem Shipbuilding Corporation and the Todd plant at Tacoma would probably bid for the work of building these vessels in the event of the appropriation being granted.

This announcement from the Navy Department was made almost immediately after the announcement that with the delivery of the submarine S-41 by the Bethlehem plant at San Francisco on January 10, all naval construction on the Pacific Coast would cease.

* * *

The Golden Gate Ferry Company of San Francisco has placed orders for propelling machinery for two new diesel-electric ferryboats, which are to be similar to the Golden Gate and Golden West, now in operation.

* * *

The newly organized San Francisco-Richmond Transportation Company was granted permission on December 18 by the Railroad Commission to sell stock in order to raise funds for the construction of ferryboats and terminal facilities for passenger and automobile ferry service between San Francisco and Richmond. The incorporators of this company are A. H. Draughton, M. O. Gordon, and J. J. Tynan.

* * *

The U. S. Engineers have called for bids to be opened February 1 for the construction of four rock scows at a cost of about $10,000 each for use in the construction of the Coos Bay, Oregon, jetty. Authority has also been received for the building of two tugs to be used for the same job, the tugs to be diesel powered.

* * *

Shipyard Notes

The steamer Colon, recently purchased by the Alaska Steamship Company from the Panama Railway Co., was formerly the steamer Mexico. She is 5670 gross tons register, is twin screw having triple-expansion engines 25 inches by 41½ inches by 68 inches cylinder bore and 42 inch stroke. She has a length of 360 feet, beam of 50 feet, and a molded depth of 32 feet 2 inches. She was built by William Crampt & Sons Ship & Engine Building Co. in 1899. This vessel will be completely reconditioned for the Alaska trade at an approximate cost of $300,000. Bids have been asked from all Pacific Coast shipyards.

With the reconditioning work on the President Pierce, the City of Los Angeles, and the Emma Luckenbach (formerly the Nanking), and the complete reconditioning of the President ships operated by the Pacific Mail Steamship Company at an approximate cost of $1,000,000 together with the regular routine voyage repairs, Pacific Coast shipbuilding plants are looking forward to a very busy year in repairs and reconditioning in 1924.

* * *

The Bethlehem Shipbuilding Corporation, Union Plant, San Pedro, California, recently launched the sixth unit of a 15,000 ton drydock. The complete dock will be 560 feet long, 126 feet wide, and with a lift-

ing radius of 28 feet on the keel blocks.

The seagoing dredge Frank M. Shallue was launched during January at Los Angeles harbor for the Pan-Pacific Dredging Company. The dredge will be powered by 1300-horsepower motors, operating a 22-inch suction line. The craft will be used for dredging Los Angeles harbor.

The Schnitzer & Wolf Machinery Company of Portland, Oregon, submitted the highest bid for the machine tools and miscellaneous plant equipment at the Skinner & Eddy Shipyard No. 2, Seattle. The bid submitted to the Shipping Board was $226,255; Ladd & Tilton, Portland, was second, bidding $177,750.

Great Lakes Engineering Works, Astabula, Ohio, are engaged in reconstructing the bulk freighter Grand Island for the Cleveland Cliff Iron Co., Cleveland, job to be completed about April 1.

The Canadian Pacific Steamship Company has ordered two passenger liners for the British Columbia-Alaska trade from John Brown & Co., Clydebank, Scotland.

New Construction

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT
Potrero Works

Purchasing Agent: O. W. Streett

Submarines USN:

S-41, hull 146.

Hull 5319, steel barge, Shell Oil Co.; 140 LBP; 26 bolded beam; 14 molded depth; keel Dec20 23.

Hull 5320, sister to above; keel Dec27 23.

San Pedro Works

Hull 5321, 115 molded depth; 37 molded breadth; 9 depth; keel Nov 15 23.

HANLON DRYDOCK & SHIPBUILDING COMPANY, OAKLAND, CALIF.

Purchasing Agent: R. Barker.

Dan F. Hanlon, hull 89, steam schr. D. J. Hanlon; 2500 DWT; 1400 IHP engines; 2 B&W boilers.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION, SAN PEDRO, CALIF.

Catalina, hull 42, excursion steamer, Wilmington Transp. Co.; 285 LBP; 52 beam; 14 loaded draft; 16 loaded speed; twin screw 3-cyl. TE engs. 3600 IHP; 4 B & W boilers; keel Dec26 23; launch May1 24, est; deliver July1 24, est.

NAVY YARD, PUGET SOUND

Medusa, repair ship for government; 460 LBP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turgine eng, 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan2/20; launched Apr16/23; deliver May15 24, est.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons disp; keel April1/21; delivery Apr1 24, est.

JAS. ROBERTSON SHIPYARD, ALAMEDA, CALIF.

Ferryboat, double-end side-wheeler, Richmond-San Rafael Ferry Co.; 172 LBP; 38 beam; 9 loaded draft; 12 knots speed; 700 IHP cross comp. engs; 2 dry back boilers, 9-2; keel Dec10 23; launch Apr21 24, est.; deliver May20 24, est.

W. F. STONE & SON SHIPBUILDING CO., OAKLAND, CALIF.

Olive, hull 51, yacht, for F. A. Hyde; 50 LBP; 14 beam; 6 loaded draft; deliver Jan1 24, est.

PRINCE RUPERT DRY DOCK & SHIPYARD, PRINCE RUPERT, B.C.

Two cruiser hulls, 60 ft. for Dominion Government Fisheries Service; deliver Dec15 23, est.

TODD DRYDOCK & CONSTRUCTION CORP., TACOMA

Six steel barges, U. S. Engineers, Portland; 120x34x7-6 feet.

No name, passenger and freight steamer, Southern Pacific Co.; 445 LOA; 57 beam; 25 loaded draft; 16 knots speed; 7000 DWT.

Repair Awards

Todd Dry Docks, Inc., Seattle, is engaged in alterations and boiler repairs to the steamer H. F. Alexander. A total of 24,000 new tubes are being installed in the boilers. A miniature railway has also been built on board, starting at one of the side ports, for the transportation of repair materials.

General Engineering & Drydock Company, Oakland, was awarded contract for the installation of a postoffice aboard the steamer President Taft on a bid of $4943. This company was also low bidder on similar installations on the President Cleveland, President Lincoln and President Wilson. A postoffice will also be installed on the Dollar Line's round-the-world liner President Hayes before she sails from San Francisco on her maiden voyage in this service.

Bethlehem Shipbuilding Corp., San Francisco, was awarded contract by the Dollar Line for general overhaul to the steamer President Hayes on a bid of $37,681.

Moore Drydock Company, Oakland, is performing general repairs to the Shipping Board steamer West Cactus on a bid of $27,954.90.

The Mare Island Navy Yard was given the work of general overhaul and machinery repairs to the Shipping Board liner President Pierce, owing to the fact that all bids from private shipyards amounted to over $100,000. The bids submitted were as follows: Eighty-day time limit: Bethlehem Shipbuilding Corp., $144,764; Moore Dry Dock Co., $189,574; Los Angeles Shipbuilding & Drydock Corp., $241,220; United Engineering Co., $246,674. The bids for 90 and 100-day limits were considerably lower. The Mare Island estimate was $97,000.

Repairs

BETHLEHEM SHHIPBUILDING CORP., UNION PLANT, SAN FRANCISCO

Drydock, paint, misc.: Erskine M. Phelps, Wm. F. Herrin (completing general damage repairs), Everet, Lurline, W. S. Miller, Las Vegas, Cragness, Frank G. Drum, Quinault, Virginian, President Harrison, Arator, W. H. Talbot, Oleum, Tamalpais, Shabone, H. T. Harper, Navarit, Henrik Ibsen, Pacifico. Misc. alterations: Sub Chaser No. 298. Convert from coal to oil burner: Nebraskan, Virginian, Shinyo Maru. Drydock and paint: Makweli, Pennsylvanian, Arizonan, Californian. Piston repairs: J. A. Moffett, Vancolite, San Edwardo, Lubrico, Richmond, Collegian, Matsonia. Install Foamite System: President Hayes. Install soot blowers: Wilhelmina also built up rudders. Propeller repairs: Cascade, Olympic, R. J. Hanna, Berecia, Meton, Lubrico also make pilot houses, Johanna Smith also 1 set of tailshafts). Lurline, Oronite, S. C. T. Todd. Water end for circulator: Rose City. One capstan Woonsocket. Tailshaft repairs: Admiral Schree, Hanley, James B. Duke. Install air pump: Priscilla. Engine, boiler and hull: Warwick also stern frames. Furnish Weir feed pump: Ranenfjord. Thirty hatch covers: Katrina Luckenbach. Ton-

nage openings: Scopas. Engine: Santa Gertrudia, Sutorpco, I. J. N. Tsurumi, Muskogee, Lena Luckenbach, Liebre, Kroonland. Piping: San Zaferino Lebec. Furnish radiators: Santiam. One boom rest: Manukai. Boilers: San Ricardo, Casiana. Hull: Lackawanna, Santiam, S. M. Spaulding. Stanchions: Circinus. Install seating for oil tank: Horace Luckenbach. Smokestack: Restless. 300 boiler tube retarders: Restorer. Misc.: Basford, Nebraskan, Missourian, Peru, Barbara C., Samoa, Floridian, Kewanee, Los Angeles, Los Alamos, Doris Crane, Alden Anderson, Buford, Mericos H. Whittier.

BETHLEHEM SHIPBUILDING CORP., UNION PLANT, SAN PEDRO, CALIF.

Drydock, clean, paint, sundry repairs: schrs. Trinidad, Murial, stmrs. D. G. Schofield, Caddo, tug Oakburn, barges No. 1, No. 7.

LOS ANGELES SHIPBUILDING & DRYDOCK CORP., SAN PEDRO, CALIF.

Drydock, paint, engine, boiler and misc.: Livingston Roe, San Gerardo, Zoppot. Dock for inspection, misc.: El Cicuta. Dock and paint: tugs Bahada, D. M. Benton, launch Accomae. Dock, misc. boiler, engine, aux., paint topsides: Mojave. Electrical and sundry: Hoxbar, El Cedro, Skagway. Engine: Casiana, Calawaii (also deck repairs), Jacob Luckenbach, El Abeto, Muskogee. Auxiliary repairs: T. J. Williams, Lio (also turbine repairs). Boiler: Moerdyk. Miscellaneous: Narbo, Humboldt, Charlton Hall, Yale, H. W. Baxter, Centralia, Levant Arrow, Cerro Azul, R. J. Hanna, A. C. Bedford.

MOORE DRY DOCK COMPANY, OAKLAND, CALIF.

Alterations to hull: President Wilson, President Lincoln. Drydock, hull, engine and deck: Frank H. Buck. Drydock, clean, paint: B. F. Cheney, Lehua. Drydock, clean, paint, sundry hull, deck and engine repairs: President Pierce, Midway, Cascade (renew stern frame), West Cactus, Hulaco, Alden Anderson, tug H. J. Biddle, barge Crockett, stmrs. Thordis, Fred Baxter, San Juan, Martha Buehner, tugs Virgil Bogue, Crolona, stmrs. Necanicum, Columbia, Somme, Pyramid. Drydock, hull damage: Brookings. Install refrigerator, misc.: Tachee. Furnish and install propeller: tug Pedro Costa. Furnish and install new stack: Capt. A. F. Lucas. Engine: South Coast, La Merced, William Campion. Engine and deck: Munrio, Tamaha, Tydeus. Hull: West Carmona, Frank Lynch (also engine repairs), Crescent City (also deck repairs). Boiler: Lucas, El Segundo. Misc.: London Merchant, ferryboat Claremont.

NAVY YARD, PUGET SOUND

Docking and misc.: Idaho, Tennessee. Renew one turret gun: Texas. Sundry: Pennsylvania, Nitro, Milwaukee. Docking and sundry repairs: Empress of Canada, Dellwood. Hull: Zeilin. Repairs incidental to operation as district craft: Mahopac, Swallow, Tatnuck, Iroquois, Pawtucket.

THE SPEDDEN SHIPBUILDING CO., BALTIMORE, MD.

General overhauling of boiler: tug Atkins Hughes, stmr. Dreamland. Drydocking, plates on hull: tugs Dandy, Mary O'Riordan (also repairs account of sinking). Drydocking, misc.: tugs Walter Wyman, Edith Goddard, Fearless. Voyage: stmrs. West Cohas, Quaker City, Conehotta.

TODD DRY DOCKS, INC., SEATTLE, WASH.

Installation of boiler tubes, etc.: H. F. Alexander. Reconditioning: Emma Alexander (formerly Nanking). Damage: Colusa. Docked, cleaned, painted: tugs Mountaineer, Humaconna, stmrs. Delrosa, Orcus, Margaret Dollar. Docked, cleaned, painted, misc.: Katrine Luckenbach, President McKinley, President Madison Maintenance: Bakersfield. Steering gear: barge Bertrand. Misc.: Sutorpco, tug Roosevelt, strs. Iyo Maru, Los Alamos, Somedono, yacht Hoqua, strs. Tyndarus, Julia Luckenbach, Scottish American, Sumanco, Sachreu.

Atlantic, Lakes, Gulf and Rivers

AMERICAN BRIDGE COMPANY, PITTSBURGH, PENN.

Purchasing Agent: W. G. A. Millar.

Forty coal barges, Carnegie Steel Co., 75 long by 26x11; 19 delivered.

Five coal barges, West Kentucky Coal Co.; 175x26x11 feet; 2 delivered.

Twenty coal barges, Carnegie Steel Co.; 175x26x11 feet; deliver spring 1924.

Nineteen barges, U. S. Engineers, Louisville, Ky.; 110x26x6-6; deliver July/24, est.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft; deliver 1924, est.

Sixteen barges, U. S. Engineers, Louisville; 110x26x6-6; deliver Oct 1 24, est.

THE AMERICAN SHIP BUILDING CO., LORAIN, OHIO

W. H. Gerhauser, vice-president and director of purchases.

Greater Detroit, hull 785, paddle steamer Detroit & Cleveland Nav. Co.; 535 LBP; 98 beam; 16 loaded draft; 20 mi loaded speed; 3 cyl comp engs, 10,000 IHP; 6 SE and 3 DE Scotch boilers, 14x20; keel Feb 10/23; launched Sept14/23; deliver spring, 1924.

Greater Buffalo, hull 786; sister to above; keel May2/23; launched Oct 27 23.

No name, hull 788, bulk freighter, Ford Motor Co.; 590 LBP; 62 beam; 20 loaded draft; 13 loaded speed; 12,000 DWT; 3300 IHP; Doxford diesel engs.

BATH IRON WORKS, LTD., BATH, MAINE

Purchasing Agent: J. L. P. Burke.

Light vessel 107, hull 87, second-class light vessel US Dept of Commerce, 109-6 LBP, 30 beam, 14-4 loaded draft, 9½ speed; comp eng, 400 IHP; 2 Scotch boilers, 10-6 x 11-5; keel Apr14/22; launched Dec8/23; deliver Feb1/24, est.

Light vessel 110, hull 91, sister to above; keel Oct6/22; launched Nov 10 23; deliver Jan15/23, est.

Light vessel 111, hull 92, sister to above; hull only; keel Aug21/23.

No name, hull 96, yacht for Hugh T. Chisholm; 118-4 LBP; 18-6 beam; 5 loaded draft; 15 miles loaded speed; two 6-cyl gas engs, total IHP 400; keel Dec1 23; deliver May1 24, est.

BETHLEHEM SHIPBUILDING CORP., FORE RIVER PLANT, QUINCY, MASS.

Lexington, hull 1300, airplane-carrier U S N.

Massachusetts, hull 1400, battleship U S N; to be scrapped.

S-44, hull 1391, submarine U. S. N.

S-47, hull 1394, submarine U. S. N.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT, WILMINGTON, DEL.

Moby Dick, hull 3483, yacht, F. S. Fish; about 116 LBP; 24 beam, keel Mar29 23; launched June16/23; delivered Dec5 23.

Hull 3486, army barge, U.S. Army; keel Sept24 23.

Hull 3487, army barge, U. S. Army; keel Nov10 23.

Hull 3488, quarter boat, U. S. Army; keel Sept24 23; launched Nov 27 23; delivered Dec3 23.

Hull 3489, U. S. Army; keel Dec8 23.

BETHLEHEM SHIPBLDG. CORP., SPARROWS POINT PLANT, SPARROWS POINT, MD.

Alexander Hamilton, hull 4217, passenger vessel Hudson River Day Line; 325 LBP; 76 beam over guards; 13-8 deep; 1 TE eng, inclined, 3500 HP; 2 single and 2 double ended boilers; keel Apr2 23; launched Oct 20 23.

Boston, hull 4218, passenger vessel Eastern Steamship Co.; 385 LBP; 72-6 beam; 23-9 moulded depth; twin screw turbine engs, 6400 HP; 6

Scotch boilers; keel Mar13/23; launched Oct27/23.

New York, hull 4219, sister to above; keel Apr3/23; launch Jan12/24, est.

Hull 4220, barge, Sanford & Brooks; keel July5 23.

Hull 4222, oil barge, Standard Oil Co. (N. J.).

Hull 4223, sister to above.

Hull 4224, sister to above.

Hull 4225, sister to above.

Hull 4226, sister to above.

Hull 4227, sister to above.

CLINTON SHIPBUILDING & REPAIR CO., PHILADELPHIA, PA.

No name, hull 45, oil barge, City of Phila.; 88 LBP; 30 beam; 8 loaded draft; keel June 23, est; launch July/23, est; deliver Aug 23, est.

CONSOLIDATED SHIPBUILDING CORPORATION, MORRIS HEIGHTS, N. Y.

No name, hull 2739, stock; same as above.

WigWag, hull 2744, D. cruiser, H. S. Borden; 62x10-6; speed 30 mi; two 300 HP Speedway engs.

Hulls 2746-50, inc, stock; 34x8-6; hulls only; 3 delivered.

Klahanee, hull 2752, tender, L. M. Wainwright; same as above.

Cynthia, hull 2754, tender, M. B. Mills; 25x'x3; 28 HP Speedway eng.

Hulls 2755-56, 26-foot tenders for Cox & Stevens.

Hull 5757, runabout, Sidney A. Smith; 60 HP Speedway engs.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Purchasing Agent: Ed. C. Geehr.

Trenton, hull 501, scout cruiser USN; keel Apr18/20; launched Apr 16/24; 86.8 per cent comp Jan1/24.

Marblehead, hull 502, scout cruiser USN; keel Aug4/20; 75 per cent comp Jan1/24; launched Oct9/23.

Memphis, hull 503, scout cruiser USN; keel Oct4/20; 59 per cent comp Jan1/24.

DEFOE BOAT & MOTOR WORKS, BAY CITY, MICH.

No name, hull 61, yacht builder's account; sister to above; keel June 28/22; launched Aug6/23; delivery June 1/24, est.

Reomar III, hull 70, R. E. Olds, 100 LBP; 18-6 beam; 4 loaded draft; diesel eng, 250 IHP; keel Sept1/23; launched Nov15/23; deliver June 1/24, est.

Two steel car floats, Erie R. R.; 186 long; 34 beam; 8 depth; launch Apr12/24, est; deliver Apr15 24, est.

DRAVO CONTRACTING CO., PITTSBURGH, PA.

Hulls Nos. 265-272, inc., 8 steel barges, U. S. Engineers, 430 gross tons each.

Hulls Nos. 279-281 inc., 3 steel sand and gravel barges, builder's account; 135 gross tons.

Hulls 282-285 inc., 4 steel dump scows, builder's account.

Hulls 293-306 inc., 14 steel barges, Mississippi River Commission, Memphis; 430 gross tons each.

Hull 307, steel sand and gravel barge, builder's account, 135 gross tons.

Hulls 308-313, inc., 6 steel dump scows, U. S. Engrs., Louisville, 127 tons each.

Hull 316, steel oil barge, Mexican Petroleum Corp.; 230 gross tons.

Hull 317, derrick boat, U. S. Engineers, Huntington, W. Va.; 100 gross tons.

Hull 318, steel hull for sand dredge; Mississippi River Com., Memphis; 78 gross tons.

Hulls 319-327, inc, 9 steel derrick boat hulls; 115 gross tons each; for U. S. Engineers, Louisville, Ky.

Hulls 330-331, 2 steel sand and gravel barges, Empire Limestone Co., Buffalo.

Hull 332, steel barge, U. S. Engineers, New Orleans; 120x30x7; 430 tons.

Hull 333, sand digger; Ohio River Sand Co., Louisville; 155x42x7-6; 430 tons.

Hull 334, sand digger, Keystone Sand & Supply Co.; 155x42x7-6; 430 tons.

DUBUQUE BOAT AND BOILER WORKS, DUBUQUE, IOWA

Hulls 70 to 74, inc., oil barges, U. S. Engineers, Rock Island; 100 LBP; 30 beam; 6 loaded draft.

Hulls 75-76, 2 oil barges, U. S. Engineers, Cincinnati; 100 LBP; 30 beam; 6 loaded draft.

Hull 77, hull for towboat, U. S. Engineers, Nashville; 80 LBP; 20 beam; 4-6 loaded draft.

FEDERAL SHIPBUILDING CO., KEARNY, N. J.

Purchasing Agent: J. L. Hastings.

Hull 78, barge, Seaboard Shipping Company.

FRASER, BRACE, LIMITED, THREE RIVERS, QUEBEC

John C. Howard, hull 20, Lake freighter George Hall Coal Co. of Canada; 250 LBP; 43 beam; 16-6 loaded draft; 12 loaded speed; 3270 short tons DWT; TE eng, 1400 IHP, 19x32x56-36 stroke; 2 Scotch marine boilers, 14-7 x 10-8, coal burning; keel Apr/22; launched May5/23.

GREAT LAKES ENGINEERING WORKS, RIVER ROUGE, MICHIGAN

Purchasing Agent: Chas. Short.

Hull 245, bulk freighter, Ford Motor Co.; 586 LBP; 62 beam; 20 loaded draft; 13 mi speed; 13,500 DWT; 3300 IHP Doxford engs; keel Nov26 23.

Hull 246, flat scow, M. Sullivan, Detroit.

Hull 247, bulk freighter, H. K. Oakes, Franklin S. S. Co., Cleveland; 612 LOA; 586 LBP; 62 beam; 32 depth; 20 loaded draft; 13,500 DWT; 12 mi. speed; deliver Oct1 24, est.

HOWARD SHIP YARDS & DOCK CO., JEFFERSONVILLE, IND.

Purchasing Agent: Jas. E. Howard.

Steel tow boat; 140 long; 32 beam; 6½ depth hold.

Two steel river boats, U. S. government.

MANITOWOC SHIPBUILDING CORP., MANITOWOC, WIS.

Pere Marquette 21, hull 209, car ferry, Pere Marquette Ry. Co.; 348 LBP; 56 beam; 16 loaded draft; 14 mi. loaded speed; 2 sets TE engs; 2750 total IHP; 4 Scotch boilers, 14x6x11; 18 lbs pres; keel Oct1/23; launch Jan15/24, est; deliver Mar 15/24, est.

Pere Marquette 22, hull 210, sister to above; keel Dec20 23.

Steel barge, War Dept. U. S. Gov.! 175 ft. long; 40 ft. molded beam; 11 ft. 6 in. molded depth.

Steel tug, Great Lakes Dredge & Dock Co., Chicago; 75 ft. long; 21 ft. molded beam; 11 ft. molded depth; 300 HP oil engs.

MARIETTA MANUFACTURING COMPANY, POINT PLEASANT, W. VA.

Sailor, hull 137, towboat, Jones & Laughlin Steel Corp.: 165 LBP; 36 beam; 7-6 depth; 105 gross tonnage; 16x32x8 ft Tandem comp engs, western river return tubular boilers; keel Oct1/23; launch Feb1/24, est.; deliver Feb1/24, est.

No name, hull 138, sister to above.

MIDLAND BARGE COMPANY, MIDLAND, PA.

Louisville, hull 17, side wheel, Louisville & Cincinnati Packet Co., Cincinnati, O.; 285 LBP; 80 beam; 700 DWT; launched Dec 23.

Hull 32, maneuver boat hull, U. S. Engs., Huntington, W. Va.; 60 LBP; 26 beam; 83 DWT; keel Jan1 23, est; launch Feb1/24, est; deliver Feb25 24, est.

Hull 33, derrick boat hull, U. S. Engrs., Mobile; 80 LBP; 34 beam; 105 DWT; keel Feb1 24, est; launch Mar1/24, est; deliver Mar15 24, est.

Hull 34, sand and gravel barge, E. T. Slider Co., New Albany, Ind.; 176 LBP; 50 beam; 400 DWT; keel Feb15 24, est; launch and deliver, Mar/24, est.

NASHVILLE BRIDGE COMPANY, NASHVILLE, TENN.

Purchasing Agent: Leo E. Wege.

Hulls 62-64, barges for U. S. govt, 80 LBP; 26 beam; 4 loaded draft; keel Mar1 24, est; deliver May12 24, est.

No name, hull 65, dredge, W. T. Hardison & Co.; 110 LBP; 30 beam; 6 loaded draft; keel May 1 24, est; deliver June 1 24, est.

Hulls 66-71 inc, pontoons, U. S. Engineers, Cincinnati; 40 LOA; 12 beam; 3 loaded draft; keels May 24, est.

No name, hull 72, deck barge, Cumberland Transportation Co.; 100 LBP; 20 beam; 5 loaded draft; deliver Jan 24, est.

No name, hull 73, open barge; sister to above.

No name, hull 74, deck barge sister to above.

No name, hull 75, open barge; sister to above.

NAVY YARD, BOSTON

Whitney, destroyer tender No. 4, U. S. Navy; 460 L.B.P.; 61 beam; 21 loaded draft; 16 knots loaded speed; 10,600 tons displ; 7000 S.H.P. geared Parsons turbines; 2 W.T. express type boilers; keel Apr23/21; launched Oct12/23; deliver 1924, est.

NAVY YARD, PHILADELPHIA

Dobbin, hull 7, destroyer tender USN; 460 LBP; 60-10 beam; 21 loaded draft; 16 loaded speed; 10,600 tons disp; Parsons geared turb single screw engs, 7000 SHP; 2 WT boilers; keel Dec23/19; launch May 5/21; deliver July/24, est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY, NEWPORT NEWS

Purchasing Agent: James Plummer, 233 Broadway, New York City.

J. H. Senior, hull 273, oil tank barge, Standard Oil Co. (N. J.); 210 LBP; 38 beam; 16-6 depth; 9 loaded speed; capacity 11,000 barrels; McIntosh & Seymour diesel engines; 455 HP Westinghouse motor; keel Oct22/23; launched Jan5/24; deliver Feb 24, est.

No name, hull 276, freight and passenger steamer, Old Dominion Steamship Co.; 375-6 LBP; 53 beam; 29-9 depth; speed 16 knots; 2100 DWT; Newport News-Curtis turbines, 4750 SHP; B&W boilers.

No name, hull 277, sister to above.

NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

Purchasing Agent: L. G. Buckwalter.

No name, hull 265, bulk oil stock; 419-3 LBP; 56-3 beam; 25-9¼ loaded draft; 10¾ loaded speed; 9870 DWT; 3 cyl TE engs, 300 SHP; 3 SE Scotch boilers, 15-10x11-4; keel Feb28*23.

Carabobo, hull 278, combn str Red D Line; 305 long by 48 by 22; 12½ speed; 2200 SHP; turbines with reduction gear; Scotch boilers; keel Feb9/23; launched Oct27/23; delivered Dec28/23.

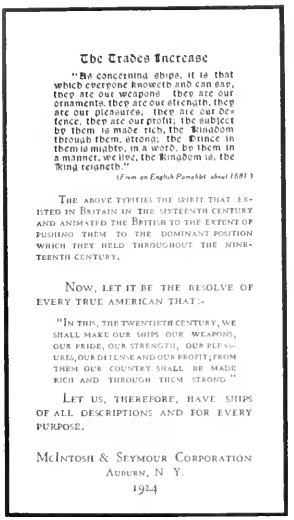
Arthur N. Herron, hull 279, tug, American Dredging Co.; 100x23x12 ft; 500 BHP; Winton diesel engs; keel Sept1/23; launched Nov26/23.

Hulls 280-289, ten carfloats, Pennsylvania R. R. Co.; 250 ft long; two tracks; 6 delivered; 4 on ways.

Hull 290, self propelled oil barge for Standard Transp. Co.; 260x40x14 feet; two 350 BHP diesel engs; keel Dec18/23.

Hull 291; sister to above; keel Dec20/23.

Hull 292; sister to above; keel Dec27/23.



A splendid New Year sentiment

SPEDDEN SHIPBUILDING CO., BALTIMORE, MD.

Purchasing Agent, W. J. Collison.

Tug A, Hull 255, U. S. Engineers, Phila.; 50 LBP; 14-1½ beam; 5 loaded draft; 41 DW tons; 100 HP Mianus engs; launch Jan1/24, est.

Tug B, hull 256; sister to above; launch Jan15/24, est.

Tug C, hull 257; sister to above; launch Feb1/24, est.

Tug D, hull 258; sister to above; launch Feb15/24, est.

STATEN ISLAND SHIPBUILDING COMPANY, STATEN ISLAND, NEW YORK

Purchasing Agent: R. C. Miller.

No name, hull 749, steel diesel-electric tugboat, Penn. R. R. Co.; 105 LBP; 24 beam; 13.5 loaded draft.

No name, hull 750, steel diesel-electric tugboat, Atlantic Refining Co.; 94 LBP; 21 beam; 11.5 loaded draft.

No name, hull 751; sister to above.

No name, hull 752; sister to above.

SUN SHIPBUILDING COMPANY, CHESTER, PENN.

Purchasing Agent: H. W. Scott.

A. MacKenzie, hull 58, hopper dredge US Engrs; 245 LBP; 46 beam; 19-6 loaded draft; 10½ loaded speed; 2000 DWT; diesel-electric drive; keel Mar9/23; launched Nov20/23; deliver Jan20/24, est.

W. L. Marshall, hull 59, sister to above; keel Mar26/23; launched Nov 20/23; deliver Feb20/24, est.

Dan C. Kingman, hull 60, sister to above; keel June18/23; launch Feb 1/24, est.

Wm. T. Rossell, hull 61, sister to above; keel June21/23; launch Mar 1/24, est.

Schenectady Secony, hull 73, motor barge, Standard Transp. Co.: 260 LOA; 40 beam; 14 depth; 2 350 BHP diesel engs; keel Dec5/23.

Amsterdam, hull 74, sister to above; keel Dec5/23.

Rome, hull 75, sister to above; keel Dec5/23.

Oswego, hull 76, sister to above; Dec20/23.

Burlington, hull 77, sister to above; keel Dec20/23.

Hull 78, oil barge, Sun Oil Co.; keel Jan14/24, est.

Hull 79, oil barge, N. Y. Central R. R. Co.; 144 LBP; 27 beam; 11-6 depth; 1100 DWT; keel Jan15/24, est.

No name, hull 80, oil barge, Tidewater Oil Co.: 26 ft. long; 32 ft. beam; 10 ft. depth.

THE TOLEDO SHIPBUILDING CO., TOLEDO, OHIO

Purchasing Agent: H. M. Ives.

William K. Field, hull 176, bulk freighter, The Reiss S. S. Co., Sheboygan, Wis.; 580 LBP; 60 beam; 20 loaded draft; 12½ loaded speed; 12,000 DWT; TE eng, 2500 IHP; 3 Scotch boilers, 14 ft; keel June2/23; launch Oct/23, est; deliver Nov /23, est.

THE CHARLES WARD ENGINEERING WORKS, CHARLESTON, WEST VIRGINIA

Purchasing Agent: E. T. Jones.

Greenbrier, hull 21, U. S. Lighthouse tender; 164-6 long by 32-6 by 5; two non-condensing HP engs, 15-inch diam cylinder, 84-inch stroke; 3 Mississippi River type boilers, 26 ft long, coal burning, natural draft; keel June26/23; launched Nov13/23! deliver Feb/24, est.

J. B. Battle, hull 28, 100-ft diesel-electric towboat, U. S. Engs., Mobile; keel Apr12/23; launched July 17/23; delivered Dec31/23.

C. B. Harris, hull 31, 24-in pipe line dredge, U. S. Engrs., Cincinnati, O.; 175 long by 50 by 81; pumping engs 1000 BHP McIntosh & Seymour diesel; 2 aux 225 BHP McIntosh & Seymour engines; keel Sept20/23; launch Mar1/24, est; deliver Mar /24, est.

Tacoma, hull 32, steel hull, Cincinnati Pomeroy & Charleston Packet Co., Cincinnati, O.; 190 long by 37 by 6; keel Jan14/24, est; launch Apr1/24, est.

Lookout, hull 33, towboat, U. S. Engineers, Nashville, Tenn.; 116 ft. long; 29 ft. beam; 5-6 depth; 2 surface condensing tandem comp. engs, 300 HP; 1 watertube boiler; coal burning; natural draft; keel Feb4/24, est.

Progress of Construction

Recent Contracts

Bethlehem Shipbuilding Corp., Union Plant, San Pedro Works, oil barge 115 by 37 by 9 feet.

American Bridge Co., Pittsburgh, 16 barges for U. S. Engineers office at Louisville; 110 by 26 by 26½ feet.

Bethlehem Shipbuilding Corp., Harlan Plant, Wilmington, Del., barge for U. S. Army.

Bethlehem Shipbuilding Corp., Sparrows Point Plant, six oil barges for the Standard Oil Co. (N. J.)

Dravo Contracting Co., Pittsburgh, steel barge for U. S. Engineers Office, New Orleans, 120 by 30 by 7 feet; sand digger, Ohio River Sand Co., Louisville, 155 by 42 by 7½ feet; sand digger, for Keystone Sand & Supply Co., 155 by 42 by 7½ feet.

Great Lakes Engineering Works, River Rouge, Mich., bulk freighter for the Franklin Steamship Co. of Cleveland; 586 L.B.P., 62 beam, 32 depth, 20 loaded draft; this is same type steamer as this company is building for the Ford Motor Co.; flat scow for M. Sullivan, Detroit.

Manitowoc Shipbuilding Corp., Manitowoc, Wis., steel barge for the War Dept., 175 by 40 by 11½ feet; two steel tugs for the Great Lakes Dredge & Dock Co., Chicago, 75 by 21 by 11 feet, 300 horsepower oil engines.

Keel-layings

Two steel barges for Shell Oil Co., Bethlehem Shipbuilding Corp., Union Plant, Potrero Works, Dec. 20 and 27; oil barge, San Pedro Works, Nov. 15.

Catalina, excursion steamer, Wilmington Transp. Co., Los Angeles Shipbuilding Corp., Dec. 26.

Barge, U. S. Army, Bethlehem Shipbuilding Corp., Harlan Plant, Dec. 8.

Pere Marquette 22, carferry, Pere Marquette Ry. Co., Manitowoc Shipbuilding Corp., Dec. 20.

Three self-propelled oil barges, Standard Transp. Co., New York Shipbuilding Corp., Dec. 18, 20, 27.

Launchings

J. H Senior, oil tank barge, Standard Oil Co. (N. J.), Newport News Shipbuilding & Drydock Co., Jan. 5.

Deliveries

Two coal barges, West Kentucky Coal Co., American Bridge Co., during Dec.

Moby Dick, yacht, F. S. Fish, Bethlehem Shipbuilding Corp., Harlan Plant, Dec. 5; Quarter boat, U. S. Army, Dec. 3.

Carabobo, combination steamer, Red D. Line, New York Shipbuilding Corp., Dec. 28.

J. B. Battle, diesel-electric towboat, Chas. Ward Engineering Wks., Dec. 31.

Yard Notes

The Great Lakes Engineering Works has received an order for another standard bulk freighter similar to the one they are now building for the Ford Motor Company. Details of the vessel will be found under Progress of Construction.

The motorship Lebore, combination ore and coal carrier, built by the Union Plant of the Bethlehem Shipbuilding Corporation for the Ore Steamship Co., underwent satisfactory trials January 17 on San Francisco Bay.

The Bethlehem Shipbuilding Corporation has reopened its drydock at the Harlan Plant, Wilmington, Delaware, owing to the large volume of ship repair business being done. The corporation announced that in the first eleven months of 1923 the various plants of the company on both the Atlantic and Pacific Coasts repaired 2214 ships with a gross tonnage of 8,846,000.

W. & A. Fletcher Co. of Hoboken, N. J., has taken possession of the property and equipment of the Empire Repair and Electric Welding Company, Brooklyn, and is prepared to do ship repair work of all kinds. Lloyd A. Noble is in charge of the Brooklyn plant.

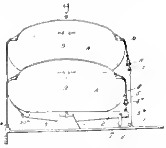
MARINE PATENTS OF THE MONTH

1,47[illegible],460 STABILIZED SHIP Herbert H Thompson and Alexander E Schein, Brooklyn N Y, assignors to The Sperry Gyroscope Company Brooklyn N Y a Corporation of New York. Filed Apr 14 1919 Serial No 289,991 8 Claims (Cl 114—122)

3. In combination, a ship, a gyroscopic stabilizer therefor, a keel for said ship said keel being adjustable to operative and inoperative positions and common controlling means for controlling the position of said keel and

for rendering said stabilizer operative, said means being adapted to render said stabilizer and keel operative separately or in combination

1,473,274 DEVICE FOR SECURING AND RELEASING LIFEBOATS Harry W Broady Bayside, N Y, assignor to American Balsa Company Inc, a Corporation of New York. Filed Sept 4 1920 Serial No 408,134 5 Claims (Cl 9—22)

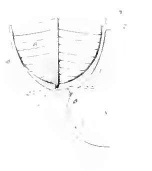


1 In combination a support for a life boat pivoted on the deck of a vessel and adapted to tilt in an outboard direction, a flexible connection secured at one end outboard of said life boat and adapted to pass transversely across the same a bell crank lever pivoted adjacent to the inboard side of said support comprising a short arm operatively connected at its free end with the inboard end of said support and a relatively long actuating arm movable from vertical inoperative position to horizontal support tilting position and means for releasably connecting the free end of said actuating arm with the inboard end of said flexible connection to fasten the same in said inoperative position

1,474,549 INTERNAL-COMBUSTION ENGINE Cornelis J H Penning, London, England Filed June 15, 1923 Serial No 645,656 8 Claims (Cl 123—51)

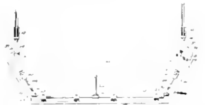
4 A reciprocating engine, wherein the crank shaft is driven by connecting rods of unequal length which connect diagonally opposite ends of opposed rockable arms to a crank pin on a suitably disposed crank shaft comprising a pair of long connecting rods and a short connecting rod, the said connecting rods engaging the same crank pin, and the long connecting rods being formed in a plurality of parts rigidly interconnected by a yoke member common to both parts of the long connecting rods the said yoke member being disposed with its lengthwise dimension approximately parallel to the axis of the crank shaft

1,47[illegible] BOAT LAUNCHING DEVICE Charles [illegible] Fi[illegible]son, Cristobal, Panama, Canal Zone and Edward F Beyer, New Orleans, La Filed Sept 15, 1922 Serial No 588,326 12 Claims (Cl 9—22)



1 A boat launching device having a movable member and retaining means for holding said member in operative position for supporting a boat, and locking means carried by the cradle and in contact with the boat held in locking position by the weight of the boat, and an automatic unlocking device for the bolt operative upon the release of the bolt from the force of gravity of the boat.

1,475,617 LIFEBOAT RELEASE Sim Emil A[illegible] Seattle Wash assignor to M[illegible] Life Boat Co Inc Seattle Wash Filed Dec 31 1921 Serial No [illegible] 4 Claims (Cl 9—23)

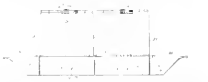


1 In a device of the character described a hook retainer comprising a channel shaped member having a solid portion formed integral between the two side portions at one end thereof, said solid portion having a bore extending longitudinally thereof a pin slidable through said bore a hook pivotally supported at the end of the channel member opposite to the one having the solid portion the hook having a shank adapted to be disposed beneath said pin whereby the hook may be releasably held against pivotal turning movement

1,47[illegible] DETECTION OF SUBMERGED OBJECTS Eliot Benson, Newton Highlands Mass assignor of one half to Francis H Williams Boston, Mass Filed Jan 21 1915 Serial No 21,[illegible] 5 Claims (Cl 181—0.5)

1 The art of [illegible] the bearing of a submerged object comprising creating a submarine sound at a known position and simultaneously observing the submarine [illegible] of the submerged object and the bearing of said known position

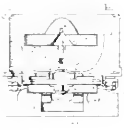
1,474,[illegible] SECTIONAL FLOATING DRY DOCK [illegible] M [illegible] New York N Y assignor of one half to Herbert M Knight M[illegible] N J Filed Jan 17 191[illegible] Serial No 271,[illegible] [illegible] Claims (Cl [illegible])



1 A [illegible] wall [illegible]

1,474,[illegible] MAGNETIC COMPASS [illegible] P Warner [illegible]

1 A [illegible] a float [illegible] its upper surface [illegible] compass an azimuth circle [illegible]

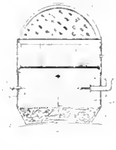


ring [illegible] said bowl and having oppositely disposed [illegible] with said azimuth circle

1,474,[illegible] BOAT [illegible] M Le[illegible] Downing, Wis Filed Jul [illegible] 192[illegible] Serial No [illegible] 1 Claim (Cl 114—[illegible])

A boat [illegible] in combination a main hull substantially tubular in form throughout a transverse bulkhead at either end of said hull a separable stern portion comprising an air tight chamber a separable bow portion comprising an air tight chamber, cellular air chambers longitudinally located within either side of the main hull and a deck over the main hull having depending side and end walls attached to the walls of the hull forming longitudinal air chambers above the last mentioned air chambers and [illegible] the hull substantially as described

1,476,387 LIFE SAVING APPARATUS Frederick W Atwell, Lake Villa Ill Filed June [illegible], 1923 Serial No 646,[illegible] 4 Claims (Cl 9—9)

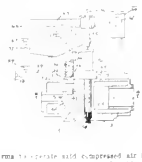


1 In life saving apparatus, two casing sections engaged with [illegible] joint, one casing being adapted for attachment to the body of the wearer, the other casing section [illegible] flexible connection with the first named casing section and being provided with a flotation [illegible] causing the same to rise to the surface the [illegible] tions combining to form therebetween a compartment a chemical within said compartment [illegible] gas upon the addition of water and means for admitting water to the compartment upon a predetermined submergence of the body to which the device is attached

1,47[illegible] VALVE CONTROL FOR DIESEL ENGINES [illegible] assignor to Atlas [illegible] Filed July 24 192[illegible] Serial No [illegible]

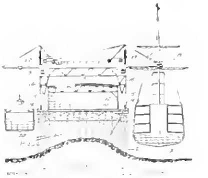
[illegible]

[illegible] ornaled on said [illegible], rocker arms [illegible] mounted on said eccentric shaft for actuating each of said valves [illegible] shaft supporting the



rocker arms to operate said compressed air inlet valve and exhaust valve independently of said air intake exhaust and fuel inlet valves

1,47[illegible],557 CARGO HANDLING APPARATUS Warren Traxell, New York N Y Filed Oct 25, 1919 Serial No 333,359 1 Claim (Cl 212—15)

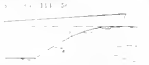


The combination [illegible] a complete operating pier comprising a piling structure with floor and house in and over water and house along close to the water edge of the pier, of additional narrow piling structures extending along said house on both water margins of the first mentioned piling structure, tied thereto and supported thereby, and a gantry crane supported by said marginal piling structures, bridging over the said house and co-operating therewith through openings in its roof

1,477,0[illegible] APPARATUS FOR WALKING ON WATER Albert [illegible] Filed Ju[illegible] 14 1[illegible] Serial No [illegible] [illegible] Claims (Cl 9—[illegible])

1 In an apparatus for walking on water [illegible] parallel floats beneath the frame means [illegible] supporting the frame on the floats a lever pivoted at its middle to the frame and links pivoted to the ends of the lever and to the floats respectively

1,475,[illegible] VESSEL PROPELLED BY GAS [illegible] CHARGED [illegible] THE WATER LEVEL [illegible] Netherlands Filed [illegible] 192[illegible] Serial No [illegible] Claims (Cl 114—[illegible])



1 [illegible] propelled by gas [illegible] with an appreciable [illegible] for guiding [illegible] to the surface of [illegible] extending substantially the [illegible] an approximately [illegible] flush with the [illegible]

Trade Literature

Increasing Marine Profits. "A group of beautiful brilliants in a splendidly chased platinum setting," is the way a friend to whom we had handed Bulletin No. 143 of the Diamond Power Specialty Corporation expressed his approval.

Elucidating further he went on to say, "Whereas many scientists have been for years experimenting to find an economical method for transforming dead black carbon into synthetic diamonds, here is a pamphlet which in condensed practical form undertakes to show every shipowner how by applying 'Diamonds' to the soot in his ship's boilers he can save enough each year to present his wife and all the rest of the family with many brilliants."

The book has fifty pages full of interesting information on fuel saving and on the care of boilers. There are numerous very fine illustrations showing actual installation on shipboard of the various types of Diamond soot blowers.

A technical article by W. D. Canan shows in detail with the aid of diagrams the actual effect on the fuel economy and cruising radius of ships which may be expected by increasing the efficiency of boilers. Here it is shown that an increase of 10 per cent in boiler efficiency means an increase in cruising radius of 20 per cent, or other things being equal an increase in overall economy of the ship of 10 per cent.

Thus a very small improvement in boiler efficiency may mean a very large economy in ship operation. We commend this booklet to the study of all who are interested in the operation of steamships.

(Continued from page 118)

and other nations with propaganda of distress, which instead of helping her cause did positive harm.

Germany Should Be Restored

It is needful to the health of Europe that Germany should be restored. She possesses a great people, naturally orderly and industrious, and who have made great contributions to the world's progress in industry, science and art. She has been badly led, but under wise leadership will become one of the most vigorous and admirable nations of the world. An impoverished, disorganized and despairing Germany would be a calamity to civilization, because the elements of strength and ability which Germany possesses cannot be spared.

It is beyond my ability to point the way out, or foretell the end of the existing situation. I believe, however, Germany needs the sympathetic help of this country, and sincerely trust that in the end Secretary Hughes' proposal to France will be agreed to, and that Germany's real ability to pay may be accurately determined and that she may be willing, unreservedly and wholeheartedly, to face the conclusion.

There are certain opinions regarding Germany more or less popular with which I disagree. One of them is that in spite of the war she is still a wealthy nation. On the contrary, I believe she is impoverished. It is true that the manufacturing facilities are intact, but they are worth not what they cost, but what they can earn. During four years of the war her entire energy was used in the production of war material which was consumed in the using, and, meanwhile, the multitudinous objects required for every day living were used up and not replaced. Her liquid capital is gone; poverty presses with few exceptions upon the whole mass of her people. The adage "Living from hand to mouth" has now become in Germany "Living from wall to mouth," indicating that in many households daily sustenance is dependent upon pictures, silver plate and other similar articles which can be sold. In point of fact, the living situation is so acute that in all probability actual outside help will be required before the winter is over. Rioting and bloodshed may come before help is extended.

Vast Foreign Deposits by Germany Not Likely

Another common belief, which I do not believe, is that the German people have vast sums on deposit in foreign countries. It is probably true that certain sinister figures in German finance and industry foresaw what would happen and accumulated foreign credits to the fullest extent that cleverness and shrewd practices would permit of, taking advantage of every opportunity for personal profit that German disorganization permitted of, but that the German people generally could accumulate funds in foreign countries is to me incredible.

It is true that a considerable sum of foreign credit was obtained through the sale of German marks, for so great was the confidence of neighboring countries in Germany's industrial capability that a large number of people were willing to speculate in mark values. There is no knowing what this sum, covering the purchase of German currency, really amountd to, but it was no doubt substantial. It would not, however, have been in sufficient volume to materially affect the German financial structure.

Depreciation of German Currency

The statement has been made that the German authorities wilfully depreciated the value of their currency in order to escape payment of reparations. This seems to me absurd, for no nation purposely commits suicide. It came about, it seems to me, through the natural operation of stupidity and inefficiency. We who are assembled here are largely representative of corporations. Supposing at a given day all the officers, executives and managing men of the corporation we are connected with were turned out in a body, what would result? Perhaps the corporation, being a going concern, would run for a time, but it soon would run down. This is what happened in Germany. After the armistice the old governmental organizations were all thrown out and new men, unfamiliar with governmental administration, took charge. The natural result was confusion and ultimate breakdown. The easiest way seemed to be that of inflation, and the avalanche was started which ultimately carried the nation into its present financial abyss.

Germany has had no training for the methods of democracy. Her people were adrift in a tumultuous sea of difficulties without competent pilots. She needed sound and friendly counsel and help, which unfortunately were not given her. I believe that her people were ready to welcome a new era, and this was evidenced by the manifestation of the "No more war" movement, but, unfortunately, the developments of the last five years have spread abroad hatred and a spirit of revengefulness which bode ill for the future.

Russia

The ruling classes of Russia sowed dragons' teeth for so many years that the fearful crop resulting therefrom is yet far from being harvested. Although the feudal system was legally abolished it continued practically in effect, and the peasants were held in economic bondage. Unless one has some knowledge of land-ownership in Russia prior to the war he cannot understand present Russian conditions. There is a certain nobleman earning a precarious living in Europe who before the war owned an estate as large as all of Denmark and yet never had even seen it. This is illustrative.

A Russian land-owner to every possible extent avoided living on his land, and, if necessary, reluctantly went to it at periods of seedtime and harvest. He nonetheless absorbed to the limit profits of the soil. When the revolution came the peasants took possession of the land and realizing that their sole right to it is in the edicts of the Soviet government, they will resist to the utmost limit the establishment of the old regime. The peasant mass, representing an illiteracy of perhaps 97 per cent, has not yet had its hope or wishes raised much above animal desires, and is intent upon holding and developing the land which it occupies and believes it will permanently own if confiscation is not thwarted.

Russian Industrial Recovery Long Way Off

The Soviet government has now realized that communism is to a large extent unworkable and they are ready to use individual capital, but the conditions offered are too restrictive to accomplish any results. For instance, the opportunity for capital to reestablish itself in Russia with a condition that there must be 51 per cent governmental ownership, which while sharing in the profits assumes none of the losses, will never recreate an industrial system, which must always rest upon the free play of individual initiative and opportunity. However, since Russia can never thrive until industrial activity again operates, it is reasonable to expect that slowly the door will be opened until finally a free flow of capital will be possible. This, however, is a long way off. Since there is no reason to expect that Russia is likely ever to pay

(Continued on page 43)

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THE COEN MECHANICAL OIL BURNER

Its Advantages as Compared with Steam Actuated Burners

STEAM actuated oil burners, home-made and otherwise, and of various designs, were in use many years before the advent of the mechanical burner. There were many objections to the mechanical burner as it first appeared, such as small capacity per burner, high oil pressure required, etc., with the result that steam burners became recognized as standard for stationary plants.

The mechanical burner, however, soon became recognized as the standard for marine work, as no steam being required to atomize the oil it soon displaced the steam or air actuated burners. In the case of steam burners the mechanical burners made a great saving in fresh water and in displacing air actuated burners; heavy air compressors with their troubles and upkeep expense were done away with.

In 1912 the Coen burner was simplified and developed so that it operated successfully on oil pressures as low as 25 pounds at the burner. An oil pressure range from 25 to 150 pounds gives a load variation of over 100 per cent without changing burner tips. This meant that one valve (oil pressure), controlled by hand or automatically, would control the size of all the fires under all the boilers it would be desired to fire with one oil pumping system.

The efficiency engineers of the larger oil companies were quick to recognize this fact, and in a short time there were hundreds of Coen burners in operation in stationary power plants of the Standard Oil and other companies. Boiler efficiencies of 80 per cent and better were obtained then, and are obtained now with the original equipment except the burner tips.

There are many Coen burner natural draft installations burning four and five and a few as high as seven pounds of oil per cubic foot of furnace volume per hour. These latter installations, however, should be made only in an emergency, as they are not economical and are too severe on the furnace. For the best economy and low furnace upkeep we recommend that one cubic foot of furnace volume be provided for each two pounds of oil to be burned per hour.

The steam jet of a steam actuated burner tends to assist the draft and steam burners are somewhat less in first cost, but with these exceptions the Coen mechanical system of oil burning has the following advantages:

1. Higher average over all efficiency and especially under overload conditions.

2. Saves 3 to 10 per cent of steam for atomizing oil in steam actuated burners.

3. Saves "make-up" feed water 3 to 100 per cent. If there were no leaks in a surface condensing plant the atomizing steam would account for 100 per cent of the "make-up" feed water.

4. Saves boiler scale in same percentage "make-up" feed water is saved.

5. Saves steel stacks, for steam used for atomizing oil in steam burners unites with sulphur dioxide in flue gases forming sulphuric acid which condenses on stack causing rapid decay. Sulphur content in oil soemtimes runs as high as 4 per cent.

6. Softer flame and better distribution of heat than steam burners, which often have a blow torch effect that is very hard on boiler tubes, shells and furnaces.

7. Quiet operation.

8. More simple to control, having oil line to burner only. Operators using Coen burners under oil stills report that they can maintain constant temperatures and carry greater loads without carbonizing tubes or burning shells.

9. Less danger of furnace explosions. We have yet to hear of a severe furnace explosion where Coen burners were used.

10. Better operating conditions with a battery of boilers, as each burner has the same oil pressure and with the same size tips will atomize the same amount of oil, making each boiler do its share of the work.

Marine Pumps

THE Northern Fire Apparatus Company of New York is justly proud of an order recently received from the Newport News Shipbuilding & Drydock Company. This order calls for complete pumping equipment to be installed on a diesel-driven oil tanker now building at the Newport News yard. In detail it is as follows:

Bilge Pumps

One Northern rotary pump, with bronze pump case and rotor and mounted on a common bedplate with and directly driven by a 5-horsepower Westinghouse 115-volt direct current constant speed motor. The pump must have a capacity of 60 gallons of salt water per minute when working against a discharge pressure of 75 pounds per square inch.

Sanitary Pump

One Northern rotary pump, with bronze pump case and rotor and mounted on a common bedplate with and directly driven by a 2-horsepower Westinghouse 115-volt direct current constant speed motor. The pump must have a capacity of 20 gallons of salt water per minute when working against a discharge pressure of 100 pounds per square inch.

Fuel Oil Transfer Pump

One Northern rotary pump, with bronze pump case and rotor and mounted on a common bedplate with and directly driven by a 2-horsepower Westinghouse 115-volt direct current constant speed motor. The pump must have a capacity of 20 gallons of fuel oil per minute when working against a discharge pressure of 100 pounds per square inch.

Cargo Oil Pumps

Three Northern rotary pumps, each with cast iron pump case, bronze rotor and shaft sleeve and driven through reduction gearing by a 35-horsepower Westinghouse 115-volt direct current 800 1150 r. p. m. variable speed motor. Each pump must have a capacity of 375 gallons of petroleum products per minute when working against a discharge pressure of 100 pounds per square inch.

Fire and Bilge Pump

One Northern rotary pump, with bronze pump case and rotor and mounted on a common bedplate with and directly driven by a 25-horsepower Westinghouse 115-volt direct current constant speed motor. The pump must have a capacity of 250 gallons of salt water per minute when working against a discharge pressure of 100 pounds per square inch.

Delivery of this order, together with necessary spares and tools, was made about the middle of November.

New Ventilating System

WITH the installation of new ventilating systems on vessels of the Clyde Steamship Company, officials of that company state that citrus fruits and vegetables can now be delivered to New York and other eastern markets in as perfect condition as when packed in Florida.

The steamships Lenape and Mohawk have already been equipped at the Tietjen & Lang plant of the Todd Shipyards Corporation, and similar installations are now being made on the other vessels with which the Clyde Line maintains its passenger and freight service between Jacksonville and New York.

The design of the new ventilating system is such that during the entire run from Jacksonville to New York a constant circulation of fresh air is maintained through the cargo spaces in the upper decks, where the fruit and vegetables are carried. At no time during the voyage is it possible for stale or heated air to remain with the cargo.

The system in general consists of four 10,000 cubic feet motor driven fans, static pressure 3 inches, arranged two for air delivery and two for air exhaust. The delivered air is taken from the atmosphere through two 27 by 27 inch vents, forward of the forward end of boiler casing to the fans, thence through a system of ducts to the sides of the ships close to the main deck to delivery openings spaced approximately 16 feet apart for the entire length of cargo space.

The exhaust air is taken from about the center line of the ships, except in way of engine and boiler casings, when it is taken close to cargo sides of same, close under hurricane deck, through a system of ducts to the exhaust fans and thence into boiler room casing. This insures a positive and continuous movement of air from the sides of the ship to the center and, when space is empty, a five-minute air change. With fruit cargo properly stowed a $2\frac{1}{2}$ minute change, or even less, can be attained with the fans working at a three-inch static pressure.

Trade Literature

Centrifugal Pumps. This new 72 page catalog issued by the Le Laval Steam Turbine Company, Trenton, New Jersey, exhibits the marked development which has occurred in the improvement of centrifugal pumps, as well as in the direction of larger size and wider use. The rapid extension of the field of the centrifugal pump has been in large part due to improved efficiency, simplicity and ease of maintenance. The casings are split horizontally so that internal parts are at once accessible upon lifting the cover.

De Laval pumps are stated to be manufactured to limit gages, assuring interchangeability, so that renewals can be inserted by unskilled men, as they do not require to be fitted and no adjustment of any kind is required.

Centrifugal pumps driven by steam turbine or electric motor are used almost exclusively for circulating condenser water and are also extensively applied for feeding boilers at the highest pressures.

In water works service, centrifugal pumps driven by geared steam turbines are built in sizes up to 5000 water horsepower and over, and realize duties closely paralleling those of the best triple expansion crank and fly wheel pumps. The aggregate daily capacity of water works units built by the De Laval Company alone exceeds four billion gallons. Large electric motor driven pumping units show efficiencies from wire to water exceeding 80 per cent, the pumps themselves developing efficiencies as high as 87.2 per cent.

Centrifugal pumps are widely used for fire protection and may be driven by electric motor, steam turbine or gasoline engine. Gasoline driven pumps are often provided as standbys to motor driven pumps.

In the industries centrifugal pumps are used extensively not only for general water service, but also for handling water containing solids in suspension, such as paper pulp or rags, and for pumping chemicals.

(Continued from page 38)

the large sums which she owes to foreign investors, capital will be very timid as to Russian enterprises, and, therefore, development will be very slow.

The primary need of Russia is education. The Slavic race has great possibilities. In time Russia will become one of the great nations of Europe, but, in the meantime, she hangs as a dead weight on the prospects of European progress and stability. Until her principles of government become safe and sound she will be a menace, and until a revival of her buying power occurs, Europe will unavoidably suffer from trade depression.

Italy

Italy found herself at the close of the war in a precarious condition. Social discord was prevalent and communistic propaganda found prolific soil. Bad government added to the communistic difficulties and there was imminent danger of a social breakdown. The Fascisti movement, however, originating in the spirit of the best of Italy's young men, swept everything before it and carried Mussolini into power. It is perhaps the most remarkable revolution that history shows—bloodless in its operations and effective in its results. It has brought into force a new, sincere and real wave of patriotism which has for its goal the revival of Italian enterprise and progress. The Italian people at present have forgotten their differences and are at work. Inefficiency has been driven out of governmental departments, a horde of tax-eating sinecures have been abolished, and economies have been secured. The danger, if any, that exists is that dictatorships are always transient, and that the revival of nationalistic spirit may lead Italy into unwise measures as relates to international affairs. If she can concentrate upon her domestic problems, and the earnest spirit of progress continues among her peoples, there is every chance that Italy will in the progress of time cure the ills which the great war brought on her. Her national finances are yet far from sound, and her relations with her neighbors are not yet satisfactorily adjusted, though the recent settlement of the Fiume dispute is a very hopeful indication.

England

The problems which England is facing are such as to cause her government great concern. She is dependent for her prosperity upon her industrial activity, and the slackening of her export trade is a matter of deep anxiety. She is facing the probable unemployment of nearly two million working people before the winter is over, who cannot be turned adrift to survive or starve as circumstances may permit. Her serious problem is how to weather the storm until a restored England gives back her normal industrial markets. In the meantime there is much political unrest and more or less differences of public opinion as to policies to follow. There is without question a growing disposition to regard favorably a protective tariff with preferential duties in favor of her colonies. What effect such a policy would have upon her own situation is problematical, but it is certain if adopted would interfere with the trade flow between her and the United States. However, as long as the United States elects to erect high tariff fences as against other countries, we cannot criticise a like policy on the part of any other country.

In my judgment much depends, in relation to the progress of this sad world, upon cordial agreement between England and the United States on matters of common interest and policy. Our risks and our interests are mutual.

A STURDY work boat that is giving good harbor service between Los Angeles and Catalina Islands is the 85-foot tug "David P. Fleming," illustrated. She is owned by the Wilmington Transportation Company, Wilmington, Cal., and was built by Captain Muller.

Her 350 H. P. Full Diesel Winton Engine gives her a speed of 11 knots. She is equipped with one 30 K. W. Full Diesel Winton Generator set; one Model 100 Winton Bilge and Fire Pump; one Model W 18 Winton Auxiliary Air Compressor.

Her sister ship "Renton" has just been launched with the same Winton equipment throughout.

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Winton

Pacific Marine Review

The National Magazine of Shipping

MARCH, 1924

Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION
OF THE PACIFIC COAST

Pacific Marine Review, Vol. 21, No. 3. Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. $2.00 a year.

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The River Front at Shanghai

Pacific Marine Review

THE NATIONAL MAGAZINE OF SHIPPING
576 Sacramento Street, San Francisco
339 AT 30 CHURCH STREET, NEW YORK

J. S. HINES, Publisher
A. J. DICKIE, Editor
PAUL FAULKNER, Publicity Manager
BERNARD N. De ROCHIE, Business Manager

Official Organ of the Pacific American Steamship Association and the Shipowners' Association of the Pacific Coast.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879.

Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 20th.
Subscription price, a year (domestic).....$2.00
(foreign)..... 3.00
Single copies ..... .25

OIL MARINE TRANSPORTATION

By J. C. ROHLFS*

Manager, Marine Department, Standard Oil Company (California)

ONE of the most interesting chapters of the petroleum industry is that which deals with the story of the marine transportation of oil. The United States and Mexico produce about 88 per cent of the world's petroleum, entirely too much for home consumption. Of necessity, the industry has built up a large water-borne trade, and vast quantities of oil of great variety are transported over the oceans of the world in that remarkably specialized type of vessel, the oil tanker.

J. C. Rohlfs, Manager Marine Department, Standard Oil Company (California)

History and Development

Whale oil was at one time our illuminating oil. The year 1861 saw such a rapid decrease of whales on the high seas (with a corresponding shortage of sperm oil) that the discovery of Pennsylvania crude oil at that time was a very important event. As soon as the early Pennsylvania wells were producing, the demand for oil necessitated devising means for transporting it. Fortunately, navigable streams were near to the first oil fields, so that oil in barrels could be floated on barges down stream to the Allegheny River and so on to ready markets.

In time, home consumption could not take care of the oil produced and manufactured, and it became necessary to seek foreign markets. Necessarily, ships must carry all exportable oil, and this leads to a short history of the earlier oil-carrying vessels.

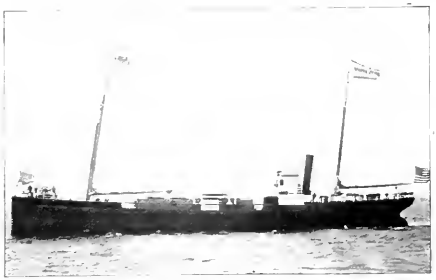
First Oil-Carrying Vessels

The first export shipment of illuminating oil was made from Philadelphia to London in the early 60's, and consisted of oil in a few wooden barrels. This experimental shipment proved a success, the barrels retaining their contents, so it was next arranged to load a complete cargo of approximately 900 barrels, via sailing ship. It required several weeks to load the cargo, and the undertaking was considered so dangerous that a sober crew could not be obtained. However, the vessel, crew and cargo reached London safely, the cargo particularly being landed in good condition.

The success of this experiment resulted in a rapid increase in trans-oceanic oil shipments, and it may here be recorded that the first oil transported in ships was in wooden barrels. Gradually this method changed from barrel transportation to case transportation, cases packing closer than barrels (there being no lost barrel bilge space), with a resultant lower freight cost. The barrel and case methods, however, had the disadvantage of leaks, with a consequent loss of oil and claims for shortages, plus the generation of dangerous gas in the hold of the vessel which required only a spark to set it off.

A study of this question naturally led to the idea that the vessel itself should be fitted with iron tanks, into and out of which the oils could be pumped. This system was adopted, and showed considerable economy over the old barrel and case method, due to quicker loading and discharging, but leakage was not conquered. As many as sixty cylindrical tanks were fitted in a vessel and the leakage, while small compared to the barrel and case leakage, generated a dangerous gas which filled the spaces between and beneath the tanks and hull of the ship. No repairs could be made, electric lights had not been introduced, and no hot rivets could be driven until, with great delay and at

* Address before the Fourth Annual Meeting of the American Petroleum Institute, St. Louis, December 13, 1923.



The George Loomis, first Pacific Ocean oil tanker, built by the Union Iron Works, San Francisco, in 1896

great expense, the gas in the hold of the vessel had been eliminated.

The Modern Oil Tanker

The next development, and now we come down to the modern tank vessel, was to build into the hold of the ship a series of tanks, by dividing the entire buoyant hull space into tanks through the use of crosswise and longitudinal bulkheads, the skin of the ship forming the outside of the tanks—and bulk oil for the first time was loaded to the skin of the ship. The division of the vessel in this manner practically achieved oil-tightness, resulting in such perfect construction that various grades of oil may be carried in adjacent tanks without danger of contamination. Some tankers are fitted for the carriage of general cargo, means being provided for the sweetening and cleaning of the oil tanks, thus permitting the carriage of bulk oil cargo one way and general freight on the return voyage. Bulk liquid return cargoes sometimes offer, consisting of cocoanut oil, creosote or molasses.

To the Riedemanns of the German-American Petroleum Company, Hamburg, must be given the credit for conceiving the idea of carrying oil in bulk to the skin of the ship. No shipyard in their own country would take up the "crazy" idea, and only one English firm, that of Armstrong, Mitchell & Company, would consider it. This firm finally fell in with the Riedemanns plan, so that in 1885 the first, what may be considered modern, oil tank steamer was built. Its name was the Gluckauf. This steamer, which was 300 feet long and carried possibly 25,000 barrels of bulk oil, discharged its first cargo at Goestemunde in July, 1886. The Gluckauf was a success. Following this vessel came the Vorwarts, Gut Heil, Wilkommen, Energie and Minister Mayback.

History records that Russia immediately followed in the steps of the German oil company, and shortly after the introduction of the Gluckauf the Russian tank steamer Sviet made its appearance. This vessel was built at Gothenburg for the Russian Steam Navigation & Trading Company of Odessa. The Sveit exported Russian oil in bulk.

In 1886 there were only about twelve bulk oil-carrying vessels. In 1891 between seventy and eighty were running from America to Baku to European oil importing ports. This really constituted the first oil tanker boom, sixty to sixty-five vessels being built in five years.

First American Tank Steamer

The first American tank steamer was fostered by the Standard Oil Company and was built in 1888 by John Roach, Chester, Pennsylvania. It was the Standard, with a capacity of 4000 barrels. In 1895 or '96 an explosion on the vessel in Philadelphia set it afire. The hull was saved, the engine and boilers removed and what remained is now a tow barge, known as Barge S. O. Co. No. 56, and still in service.

The first ocean-going Pacific tanker, the George Loomis, was built by the Union Iron Works in 1896 for the Pacific Coast Oil Company and afterwards purchased by the Standard Oil Company. This vessel had a capacity of 6500 barrels, underwent one rebuilding and finally was lost at sea with all hands in a terrific storm.

It is interesting here to note that the George Loomis required four or five days to load and about the same number of days to discharge, the loading and discharging being accomplished through two-inch lines. Up to the late war, Europe must be given credit for the development of the large capacity ocean tanker, the reason no doubt being that the American oil export companies could not build and operate American tankers in competition with foreign built and owned tankers. The size of the American tanker up to this time was governed entirely by the demands of the American coastwise oil trade. Due to government protection no foreign vessel could enter this trade.

That coastwise trade also developed the towing steam oil tanker and barges, the object being to drop the barges at ports on voyages north or south from manufacturing centers, picking them up on the return voyage for reloading. Towing was developed to such an extent that one Pacific Coast owned steamer, Richmond, and Barge No. 95, made a tow voyage around the world. The Anglo-American Oil Company, Ltd., of London, tried further development along this line by building the tank barge Navahoe and the steamer Iroquois some years prior to the war, the combined cargoes aggregating 115,000 to 130,000 barrels.

Building of Large Tankers

The requisition of foreign tankers by reason of the world war rather left the American oil companies stranded for tonnage, and an era of American tanker construction was ushered in. Refineries could no longer depend on pipelines for crude supplies, and crudes had to be imported. Heretofore tank steamers were only used for marketing purposes. Now it became necessary to have them serve the double purpose of supplying refineries with crude and transporting the finished products to market.

As it has been found more economical both to construct and operate one large vessel than two small ones, the latest American tankers—ranging from 10,000 to 21,000 tons deadweight—are much larger than the former European-built tankers. Compare this with the aforementioned tankers Standard and Loomis. It would take the cargoes of both these vessels to approximately fill one compartment of our largest American-built tanker.

Development to this size has eliminated the towing of barges by oil steamers in long voyages. The tow method is no longer considered economical.

The world's ocean tanker tonnage as of November 1, 1923, was approximately 8,000,000 deadweight tons, which, if it may be called one ship, would require a cargo of approximately 48,000,000 barrels of oil. The American tanker tonnage as of the same date was approximately 4,000,000 deadweight tons, which again, if it may be called one ship, would require a cargo of approximately 24,000,000 barrels. American oil companies, therefore, own about one-half of the tanker tonnage of the world, and the American tanker tonnage comprises over one-third of the total sea-going tonnage of the United States.

Tankers in California Trade

After the signing of the armistice, the American oil companies and the United States government through its Shipping Board found themselves over-supplied with tanker tonnage, and much of the American tanker fleet was laid up.

Suddenly the American Atlantic oil industry, which had been somewhat dependent on a Mexican crude and fuel oil supply, found itself face to face with a shortage, due to the rapid decline of Mexican production. California stepped into the breach and quickly reached a production on August 18, 1923, of 872,000 barrels per day. It was found that the large American tanker made it possible to transport crude from California to the Atlantic seaboard (a round distance of approximately 10,000 miles) at a moderate cost. The idle tanker fleet immediately found employment until at the end of November, 1923, there were approximately ninety-four large tankers in the coast to coast trade, with a deadweight of approximately 1,100,000 tons, or a little more than 25 per cent of the entire American tanker tonnage. The lifting capacity of this fleet is between 180,000 and 200,000 barrels of California oil per day, the round voyage ranging from forty to forty-five days. To complete a round voyage in this short time necessitates very quick dispatch. As before stated it required four or five days to load the first Pacific Coast tanker, the George Loomis. Today tankers are loaded in San Pedro, the oil port of Southern California, in from six and one-half to ten and one-half hours, the first for a 10,000 ton tanker and the second for a 21,000 ton tanker. They are discharged on the Atlantic seaboard in from twelve to twenty-four hours, certainly a remarkable impovement in the loading and discharge of bulk oil ships.

Concrete Tankers

Recent experiments with concrete tankers, several of which were cast for the United States Shipping Board, have not proved entirely satisfactory, although perhaps sufficient time for a fair trial has not been accorded them. However, the fact remains that the hull cracks so badly as to need frequent repairs (often in localities where there are no men skilled enough to make them), while the steel hull tanker withstands many a dent without the necessity of laying up. The weight of a concrete tanker is another handicap; in other words, a 5000 ton concrete tanker would be a much larger and heavier vessel than a 5000 ton steel tanker.

Direct Diesel and Diesel Electric Drive Propulsion

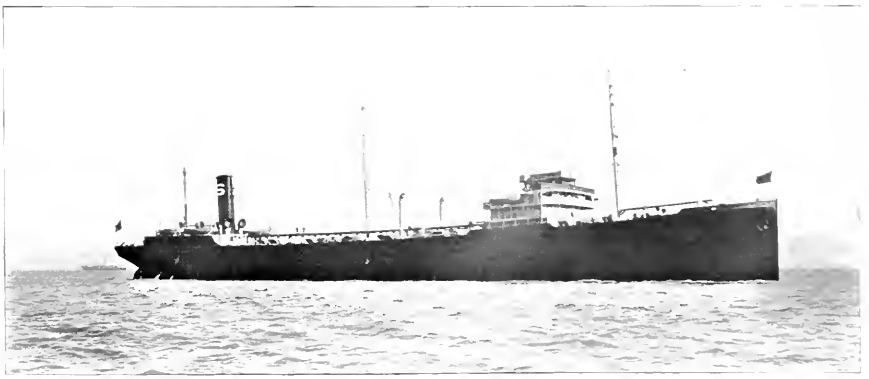
Further progress has been made toward economy in the American-owned tanker by the intoduction of the internal combustion engine (commonly known as the diesel engine), into the cylinders of which the fuel oil is injected directly for the generation of power rather than into boiler furnaces. The first all-American diesel-built tankers originated on the Pacific Coast, and they are the Charlie Watson, of 13,000 barrels capacity, and the H. T. Harper, of 35,000 barrels capacity. They were pioneered by the Standard Oil Company (California), and have been in operation for two or three years, giving excellent results.

As advantageous as direct diesel propulsion is, there is perhaps still more improvement in sight, namely, the diesel-electric drive. The same company has designed and has in operation the first all-American-built diesel-electric drive tanker, the Standard Service. It is operated by what is known as a pilot house control, and may be compared to the operation of a trolley car where the motorman has complete control from the front platform. There are no bell-pulls or other signals to the engine room, a telephone being the only means of communication. The engine room may be compared to a land power installation for the development of electricity, the rudder and propeller speed being directly controlled from the pilot house.

The Standard Service has proved such a success that the California company will place in commission this month a second boat of this type, to be known as the Alaska Standard, which will be used to serve the Alaska trade. These types of boat not only carry oil in bulk, but market all products manufactured by the company, either barrels or packages, being provided with space for a reasonable amount of package freight. The steam-driven tanker is doomed.

Transportation on Inland Waterways

Tankers are not only in use on the oceans of the world, but small tankers of every description have been built and are in operation in the harbors and on the canals and inland waterways of the United States. Hundreds of tow barges are in use on our bays and rivers. Then there are small tankers propelled by gas engines, stern-wheelers (Mississippi River type) and diesel-engine propelled boats. Here may be mentioned



A modern oil tanker, the W. S. Rheem, of the Standard Oil Company (California)

the Ohio, Mississippi, Chesapeake Bay and tributaries, Sacramento, Columbia and Hudson rivers and the Erie Canal. Wherever water is available, say three feet or over, the small tanker is introduced because it is the cheapest method of transportation known.

Construction of Ships

Ships may be termed the arteries of world commerce. If it were not for ships America and Europe would be as separate as two planets. Likewise, the construction of ships in all phases is beyond the mastery of any one man.

In the construction of a tanker, first comes the service of the naval architect, whose academic training, designing ability and experience qualify him to prepare plans and specifications to guide the builder. The naval architect economizes as much as possible in the weight of the structure, to give the greatest cargo capacity. All tank ships possess a certain amount of buoyancy, stability and speed, and as it is not possible for any vessel to attain these qualities to the maximum degree, it is the duty of the naval architect to strike a balance to obtain the best results in the trade for which the vessel is designed. The marine engineer, as the result of academic and usually machine-shop and sea experience, is called upon to select and arrange the propelling machinery for the vessel under construction. The ship and engine builders execute the plans prepared by the naval architect and marine engineer.

For the guidance of builders, protection of owners and the safeguarding of the lives of those employed on oil tankers, societies have been established whose duties are to pass upon plans and specifications before construction begins, and whose inspectors follow the progress of the work to see that it is performed in accordance with the requirements for the issuance of a certificate of seaworthiness and class. Without these certificates it would be difficult for an owner to place insurance on his ships. The two principal societies of this character are the American Bureau of Shipping and Lloyd's Register of Shipping of London.

Operation

After completion and trial trip of an oil tanker, it is turned over to the owner and placed in operation through a marine department. This department must be familiar with marine traffic and rates, charters, navigation laws, marine surveying, ship repairing, salvage operations, marine insurance, admiralty law, ship accounting, costs of operation, culinary arts, geography, world port information, custom house methods, shipping documents, etc.

The tank ship should have a life of from twenty to twenty-five years, and that oil corporation with the best ships and most efficient marine department will transport a barrel of oil cheapest.

NEW PASSENGER AND FREIGHT STEAMER

Todd's Pacific Coast Yard Captures Nice Contract in Keen Competition with Atlantic Coast Plants

THE Southern Pacific Company, Atlantic Steamship Lines, have recently contracted with the Todd Dry Dock & Construction Corporation of Tacoma, Washington, for a large freight and passenger steamer for the New York-New Orleans service. As designed, the vessel will be of the most modern and up-to-date type ever constructed for Atlantic coastwise service. The passenger accommodations and public spaces throughout will be commodious, well ventilated and of a design and arrangement not hitherto found in this class of vessel.

General Characteristics

The vessel will be of the following general dimensions:

Length over all	445 feet
Length between perpendiculars	427 feet
Beam moulded	57 feet
Depth moulded to hurricane deck	37 feet 6 inches
Designed loaded draft	25 feet 6 inches
Deadweight capacity	7000 tons

The propelling machinery will consist of De Laval compound turbines with double reduction gears. These turbines will be designed for 7100 shaft horsepower at 85 revolutions per minute of the propeller shaft.

Boiler equipment will consist of six Babcock & Wilcox marine type water tube boilers, equipped to burn fuel oil and set fore and aft with a center fire room. They will be fitted to operate under forced draft, with fans located in the 'tween decks above the boilers.

Two 50 and one 25 kilowatt reciprocating engine-driven generating sets will be installed.

The vessel's designed sea speed is 15½ knots. She is arranged to handle cargo economically and expeditiously and is fitted with 10 double cylinder steam cargo winches. The arrangement calls for 6 hatches and 8 side ports on each side.

Passenger Accommodations

Passenger accommodations will be for first-class and steerage passengers only. Plans call for 237 first cabin and 111 steerage. Crew personnel will include 24 in the deck department, 24 in the engine department, and 66 in the steward's department.

All rooms for first-class passengers will be outside rooms to insure comfort and ventilation in warm weather. These will be divided into suites with twin beds, suites with double beds, and ordinary rooms with stationary single beds, and folding upper berths, and settee berths.

Hull

Of the hurricane deck type with straight stem and semi-elliptical stern, the hull will be rigged with two pole masts and two smoke stacks. Three complete steel decks fore and aft, a steel promenade deck, and an orlop deck in the forward hold will insure ample strength and stiffness.

The superstructure will contain first cabin accommodations, music room, dining room, social hall, smoking room, lounge, and barber shop.

Steerage passengers will be accommodated forward on the hurricane deck. The deck and engineer officers' quarters, together with the mess room, hospital, and wireless room, will be located on the boat deck around the engine room casing and forward of the boiler room casing.

Public Rooms

Arrangements and design of joiner work, upholstery and draperies throughout the public spaces will differ materially from that usually seen in vessels of this type. A large number of public and private bathrooms will be provided and will be fitted with the most modern type porcelain tubs and fittings. Shower baths will be fitted in all bath rooms. Running fresh

and salt water will be supplied to suites, staterooms, officers' quarters and baths.

Cooled drinking water will be circulated throughout the passengers' and crews' quarters. Public spaces, halls and passage ways will be heated by steam and the staterooms will be heated by the Electro-Vapour radiators. Special attention has been given to ventilation of public spaces and passenger and crew's quarters. Electric fans will be provided in all staterooms and bath rooms to cool these rooms in southern waters. A complete annunciator call-bell system is provided for all rooms and public spaces.

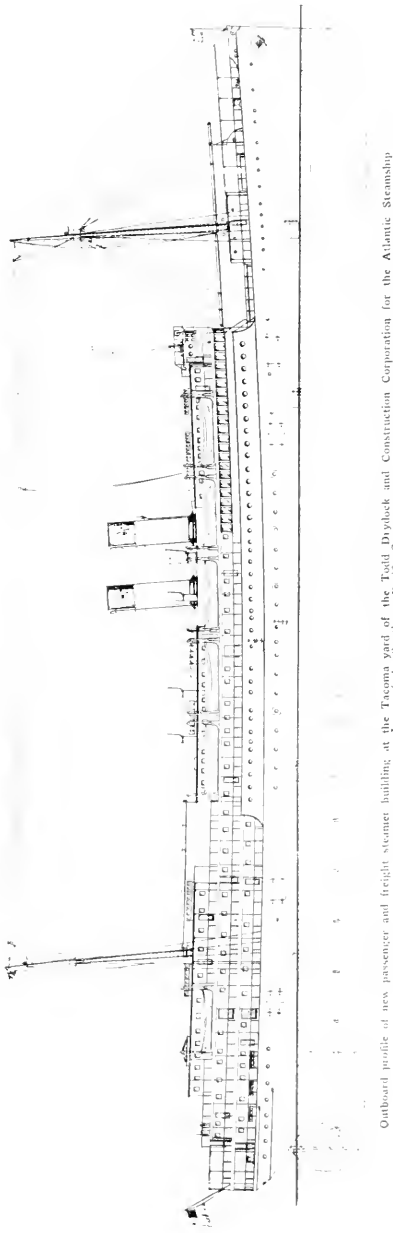
Life-Saving Equipment

The vessel will be equipped with the most modern life-saving and wireless equipment. Life boat capacity will be sufficient to take care of all persons on board, including passengers and crew. All staterooms will be provided with a complete thermostat fire alarm system in conjunction with an annunciator. In addition to the requirements of the Steamboat Inspection Service, a smoke detector system will be installed throughout the cargo spaces.

Protected Promenade

The forward end of the superstructure on the promenade deck is to be enclosed with glass windows, which will add much comfort to passengers in cold and rainy weather. The lounge will have a dance floor 20 by 26 feet, and the vessel will be provided with an electric player piano and an electrically operated phonograph. The finish throughout is of a special type designed exclusively for this ship. Every consideration has been given to the safety and comfort of the traveling public.

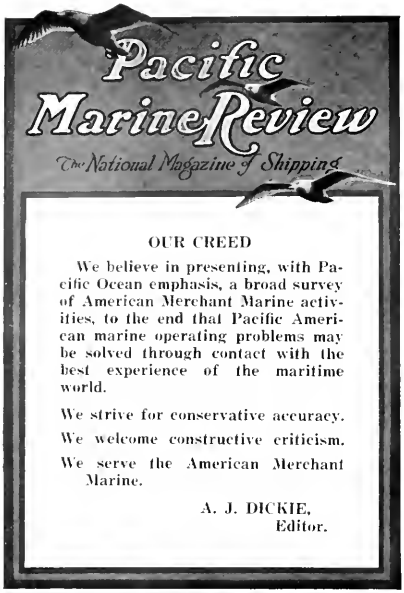
The vessel was designed by and will be built under the supervision of A. S. Hebble, superintending engineer of the Southern Pacific Company under the direction of C. W. Jungen, manager of the Atlantic Steamship Lines.



Outboard profile of new passenger and freight steamer building at the Tacoma yard of the Todd Drydock and Construction Corporation for the Atlantic Steamship Lines of the Southern Pacific Company

TO THE SCRAP PILE

THREE famous old vessels, built more than a generation ago at the Cramps shipyard in Philadelphia and continuously operated since then by the Southern Pacific Lines, have joined the increasing procession of steamships headed for the scrap heap. The William Cramp & Sons Ship & Engine Building Company has just received word that the El Mar, an iron steamer of 3531 tons gross, built by that company in 1889, has been sold to Albert Jenson for scrapping. The sister ships, the El Paso and the El Monte, built by Cramps' in 1884 and 1886, respectively, also have been sold by the Southern Pacific Company and are on their way to Rouen, France, to be scrapped. The growing demand for ships to be scrapped is shown by the sale to Cantiere Navale Triestino of Monfalcone, Italy, of the steamship Montanzas, formerly owned by the Ward Line and later purchased by the Fannie C. Brown Corporation. The St. Charles, formerly owned by McDonald & Truda, also has been sold for scrapping.



New Shipping Board Chairman

PRESIDENT COOLIDGE early in February appointed T. V. O'Connor chairman of the United States Shipping Board. This is a natural and logical choice, since Mr. O'Connor has been serving continuously as vice-chairman of the board since June, 1921.

Thomas V. O'Connor is from Buffalo, New York, of which city he has been a resident practically all his life, or since 1872. He started navigation experience as a fireman on a Buffalo harbor tug, and rose through the various stages until he had achieved papers both as chief engineer and master mariner. In 1906 he was elected president of the Licensed Tugmen's Protective Association of the Great Lakes. In 1908 he was made president of the International Longshoremen's Association, which position he held until his appointment to the Shipping Board by President Harding in 1921.

Mr. O'Connor has had considerable experience in local, state, and national politics, and in national welfare work. During the war he served as a member of the National Adjustment Commission representing the harbor workers' group. He also served on the Industrial Board of the State of New York.

Both his practical and political experience should be of great value to the new chairman. The Shipping Board needs a practical stoker, engineer, and navigator. These attributes combined in one leader should produce a more appreciable activity in the supervision of American shipping.

At the February 7 meeting of the Shipping Board, Commissioner E. C. Plummer was elected vice-chairman and Chairman O'Connor issued this brief statement:

"With the board now organized with a full membership, we will meet our problems as they come before us and handle them to the best of our ability."

Ne Plus Ultra

FEDERAL JUDGE BEAN of Portland recently decided that the Emergency Fleet Corporation cannot now be held responsible in connection with compensation for any damages arising out of the exercise of its war-time powers in awarding or canceling contracts.

If this be so, shipbuilders and others who suffered financial damage had better file their claims with Congress and charge the amount to profit and loss. Their claims may be paid in time to come in handy for the education of their grandchildren.

In making this decision Judge Bean fully recognized the effect of other decisions respecting the nature of the Emergency Fleet Corporation as a private corporation, but held that the liability as a private corporation could not be extended to include those war-time powers conferred by Congress on the President of the United States and delegated by him to the corporation.

Unfair Competition

ON numerous occasions Pacific Marine Review has directed attention to the unfairness of Navy Yard competition in the construction and reconditioning of merchant vessels. The recent award to the Mare Island Navy Yard of the reconditioning work on the President Pierce is a good example of the methods used.

For this work bids were asked from Pacific Coast shipyards and Navy Yards by the United States Shipping Board, owner of the vessel. The lowest bid from a privately-owned shipyard was $144,746 with a guarantee that the work be completed in eighty days. The Mare Island Navy Yard submitted an estimate that the work would cost $70,163, accompanied with no guarantee of time or that the cost would hold within that figure. In other words, the Navy Yard received the job on a cost contract with no guarantee and with the overhead absorbed by the Navy Department.

It will be interesting to work out complete costs when and if the job is completed.

Powering of Motorships

IN a paper on the above subject published in the 1923 transactions of the Institute of Naval Architects, K. C. Barnaby calls attention to a favorable point for the motorship which is frequently overlooked and which should be of great interest to those shipowners who persist in the medieval idea that the diesel engine is not yet a reliable prime mover.

According to this paper, "The oil engine seems less susceptible to the expert handling of trial parties and owing to initial stiffness often improves in power after several months' careful running." In particular

cases of motorships as much as a knot per hour increase in speed as compared with trial performance has been observed after a year's running. Any "engineer of a flivver" will understand this idea.

In comparison with steamers it might also be said that the oil engine is, in practical operation, for less susceptible to personal error of engine room crew and has the fire room crew entirely eliminated. The motorship, therefore, often improves in power, speed, and fuel consumption the first few years of her sea experience.

Italian Ship Subsidies

THE Mussolini administration in Italy is to continue through 1924 and indefinitely thereafter from year to year the subsidy system which was put in force early in 1923. The figures involved are interesting because they illustrate savings made possible through private control and consolidation.

In 1921-22 the essential routes involved were operated for the account of the State under the war system and 298,800,000 lire were spent for 3,800,000 miles traversed. The present arrangement is a consolidation under 19 contracts with the lines privately operated and the cost last year was 147,300,000 lire for 3,523,000 miles traversed—nearly the same mileage at less than half the cost.

None of the lines now subsidized operates beyond the Straits of Gibraltar on the Atlantic and only one of the 88 routes covered by the 19 contracts reaches the Pacific Ocean. Italy is subsidizing one voyage a month to Shanghai, one a month to Calcutta, two a month to Bombay, and 19 a year to Zanzibar, stopping at ports in the Italian colonies of Eritrea on the Red Sea and Italian Somaliland on the Indian Ocean. Outside of these voyages and others to the colonies just named, the reorganized subsidy system is confined within that Mediterranean world which Rome once ruled through the Caesars.

Four Famous Steamers

THE American Line between New York and Great Britain was thirty years ago the most popular trans-Atlantic service. Its palatial ocean greyhounds, the St. Louis and St. Paul, built by the William Cramp & Sons Ship & Engine Building Company, were the show ships of the late nineties. Two others, the Philadelphia and the New York, were built abroad and admitted to American registry.

Through failure of Congress to support this line with the necessary mail subvention, the American Line was merged into the International Mercantile Marine Company and its original service handed over to the British steamers of the White Star Line, the American Line ships and service being transferred to the New York-Hamburg route.

The four fine old steamers are now all scrapped or on their way to the scrapping yards. The St. Paul was sold to German interests last fall and towed to Hamburg for scrapping. The St. Louis, after the failure of J. Herbert Anderson to raise sufficient interest in his plan for a world trade cruise, was sold by him to a Genoa firm for scrapping. The Philadelphia, under operation by the New York and Naples Steamship Company, was beached on the Italian Coast early last year after her crew had mutinied. She will be scrap salvaged. The New York, sold to a Greek line, was libeled in Constantinople and disposed of to Italian shipbreakers.

So endeth another sad chapter in American maritime history.

Safer Than Walking

SOME very interesting statistics as to loss of life in sea travel are revealed in the last annual report of the Steamboat Inspection Service of the Department of Commerce.

During the fiscal year ending June 30, 1923, there were carried on steamboats reporting to the service, 223,000,000 passengers, of whom 59 lost their lives by accident. During the same period the lives of 907 passengers were saved by the use of appliances required by law and approved by the service.

The total of losses of life on these steamers during the year was 247. The total of accidental losses of life was 197, out of which 116 came to death by their own act, leaving 81 directly chargeable to collisions, explosions, founderings, and other ship causes. Out of this total 59 were passengers and 22 were crew.

The ratio of American sea travel in 1923 stands at 1 passenger lost to 5,476,785 passengers carried, which is considerably safer than walking.

German Merchant Marine

INTERESTING as indicating the rapid recovery of Germany in world trade are the figures recently made public by the Suez Canal Commission.

On October 23, 1920, the German flag made an appearance at Suez after an absence of 86 months. In 1913 German tonnage using the canal aggregated 3,352,000, giving Germany first place after Great Britain among Suez Canal users.

The following figures indicate clearly the striking effort made by Germany to re-occupy her former place among the carriers between Europe and the East:

In 1920	15,000 net tons
In 1921	171,000 net tons
In 1922	735,000 net tons

Group Insurance

APPROXIMATELY thirty per cent of the workers in American industries carry no insurance. this means in a large proportion of these cases absolute financial collapse of the family in case of death to the wage earner. Another thirty per cent carry not more than $500; and the average carried by the remaining forty per cent is not over $1000.

In order that this haphazard method might be changed to a systematic plan, an employer in 1910 thought of the group insurance plan and the first policy under that plan was issued in that year. From this recent beginning the plan has had a remarkable growth, until, according to a bulletin recently issued by the Insurance Department of the Chamber of Commerce of the United States, there was in force as of January 1, 1923, group insurance covering two million employes and aggregating $1,800,000,000.

FURTHER NOTES ON REFRIGERATIVE SHIPPING

Some Helpful Suggestions from the Experience of the Furness Line in Carrying Pacific Coast Fruits to European Markets

By R. J. ALEXANDER

SINCE the appearance of my article on refrigerative fruit shipments in the January issue of Pacific Marine Review, there has been considerable comment and some new light on the subject. My friend the editor passed on to me some pamphlets turned in to him by various manufacturers of refrigerator machinery, and among them I find a booklet published by Furness, Withy & Company, Ltd., of London, a firm which has for many years been experimenting with refrigerative shipments on the long runs from Canadian and United States northwest ports and from Australian and New Zealand ports to ports in the United Kingdom. The booklet is comparatively new, hving been issued in July, 1923, and was compiled in collaboration between the technical and freight departments, and through the courtesy of Furness, Withy & Company I am here enabled to offer the readers of Pacific Marine Review a summary of the most recent technical practice in British refrigerative shipping.

The fruit trade has long held the opinion that much of the loss in transshipment of fruit both by rail and by water is due to the unsuitability of full refrigeration, and it has always been recognized, and the need has partly been met, that ventilation must be combined with refrigeration.

In marine practice during recent years a system has been used of circulating the air in refrigerated compartments by means of electric fans. This system has also included arrangements for occasionally extracting all the air from the compartments and taking in a fresh supply, this fresh supply being cooled before entering. This system has been found very beneficial in reducing the amount of carbon-dioxide and preventing the accumulation of this gas, which is usually produced by the cargo.

Cold Air Circulation

Going a step further, Furness, Withy & Company in new vessels has introduced a system of keeping the fruit at the proper temperature and properly ventilated by using a combination of electric fans and ventilators with air-cooling machinery.

In these new ships the complete plant is capable of chilling the air before it enters the refrigerative compartments, keeping the air slowly but continuously circulated during the voyage, changing the air when necessary to maintain a proper percentage of oxygen and carbon-dioxide, and the changing of air in any one compartment without interfering with air circulation in any other compartment. In the cooling of the air the ordinary brine system is used, and according to Furness, Withy & Company this system has been found more effective than any other. It is recommended from experience and this bears out the experience of California rail shippers, that all fruit cargoes be precooled before being placed on board ships.

Breathing of Fruit

A very important point and one not generally understood is that fruit shipped in a more or less green state and ripening en route breathes, consuming oxygen and producing carbon-dioxide. It has been estimated in the case of apples that they absorb their own volume in oxygen in ten to twenty days at 34 to 35 degrees Fahrenheit, and the volume consumed is proportionately greater at higher temperatures. Insufficient amount of oxygen causes suffocation of the fruit, which is responsible for much of the phenomena known as brown heart and wilting in apples, and probably on further knowledge will be found responsible for much of the troubles in other fruits.

British Experiments

The Scientific and Industrial Research Department of the British Food Investigation Board has been carrying out a large number of experiments both in the laboratory and on shipboard on trips from New Zealand to Great Britain with apples. These experiments have demonstrated the importance of outfitting refrigerator cargo steamers with instruments for correct analysis of the air in the refrigerated compartments and for the correct recording of temperatures. Such instruments have been installed in connection with the new system fitted in Atlantic and Pacific refrigerator boats by Furness, Withy & Company, and it is hoped that their use will add largely to the knowledge of the exact conditions necessary for the proper shipment of fruit. Already considerable data have been accumulated and some very pertinent and practical suggestions are being put out for packing the fruit and for stowing the packages. Among these is the suggestion that a better system of staggering packages should be adopted in order to secure greater uniformity of temperature throughout the stowed mass of packages.

With all of these points in mind Furness, Withy & Company designed their new ships with carefully prepared insulated spaces located in the best possible position consistent with trim, and in their experience of carrying apples last season on the North Atlantic they demonstrated that with their new system of circulating cooled air and with the proper attention paid to stowage, it is possible to complete a season without a single complaint from shipper or consignee. They are satisfied that in course of time the same system can be worked out with equally good results for the more delicate classes of stone fruit, providing that there is sufficiently close cooperation between the ship and shore staffs in every matter of detail in connection with packing and shipping these fruits.

Practice at Portland

In this connection it is interesting to note the practice at the Port of Portland, Oregon. Close cooperation between the dock commission and shipping interests in handling refrigerator cargo is being made possible through the former making a detailed check of the type of cooling equipment of each vessel trading from Portland. The data serve to guide those in charge of the refrigerator storage facilities at Terminal No. 4, in that they are advised as to conditions in cooling rooms of vessels that are to load consignments that have been on storage at the terminal.

The announcement was recently received by T. A. Lee, Pacific Coast manager of the Furness Line of the Furness-Withy service, that work is being rushed to completion on two especially constructed motorships for Pacific Coast-European service. These motorships will be named Pacific Trader and Pacific Shipper. Refrigerated space of large capacity is installed on these vessels and they will be fitted with the new cooled air circulating system. It is expected that these boats will be in service during the coming season.

THE FUTURE OF THE UNITED STATES MERCHANT MARINE—II.

By A. C. HOLZAPFEL

IT is to be assumed that the wages and the scale of feeding on American ships will not materially differ in the future from that existing at the present time, and if there are going to be reductions in wages and in the scale of feeding, they are more likely to take place on foreign ships, thus further handicapping American vessels.

In one respect American management has shown marked superiority over foreign management and that is in the expeditious handling of ships and their cargoes. For instance, on the lakes, steamers of 10,000 tons and upwards are loaded and discharged in a few hours at a cost which is only a fraction of that incurred in European ports. But in this respect our overseas tonnage will not derive any advantage as compared with foreign vessels, because foreign vessels when they reach these shores will have the same expeditious handling, while our vessels, when they are in foreign ports, will fare no better than other vessels. The fact, however, that ships can be handled so expeditiously and inexpensively in this country indicates resourcefulness on the part of American shipowners and those in their employ, which does not exist equally in other countries, which is, however, likely to manifest itself in connection with other phases in the working out of the shipping problem.

Marine Insurance

One of the principal expenses in connection with shipping is insurance. The charge for insurance against all risks on merchant ships averages probably 8 per cent on their value. This includes insurance against total loss, collision, general average, fire, barratry, or theft, loss of life of crews and passengers, damage to cargo, etc. The heaviest claims made against insurance companies are made under the heading of "particular average;" that is, damage to a ship or her engines owing to collision, grounding or heavy weather.

Particular average claims for insurance have in past times frequently been a source of dispute by underwriters, because at one time shipowners or their employes used to arrange with the ship-repairing companies to spend money rather freely when it had to be reclaimed from the underwriters. This has gradually led to a thorough organization by the Salvage Association of London of a system of control and survey by especially appointed surveyors or agents of the Salvage Association in order to keep particular average claims at a just level. Nevertheless, even now these claims assume greater dimensions than would be absolutely necessary if a third party, the underwriter, had not to pay the cost, for the underwriter's surveyor is up against the owner's marine superintendent and the officials of the ship-repairing company, both of whom think it to their interest to get as much as possible out of the underwriters. Nevertheless the cost comes ultimately out of the pockets of the shipowners. The "total losses" of ships owing to continuous improvement in construction, also to wireless telegraphy are getting less and less.

Cooperative Insurance

Now that we have a Shipping Board and the Shipping Board has in certain cases undertaken the insurance of vessels, it might perhaps be arranged that the Shipping Board may become the underwriter or insurer for vessels which it sells to private owners. Alternately, mutual insurance clubs, such as exist in England and Norway, may, if honestly and efficiently managed, bring about a considerable reduction in cost of insurance.

Another advantage which in due course of time would accrue to American shipowners would be the larger aggregation of tonnage under one management.

I will not deal with the detailed question of other expenditure in connection with shipping, such as upkeep, in regard to which American shipowners still have something to learn as compared with the shipowners of some other countries, nor with the catering on board of passenger vessels in regard to which the free and easy American steward may be under a handicap with the more obsequious and attentive European steward, but I will now proceed to the question of how best the United States government can help shipowners to counteract the handicap of the higher wages on American ships.

Government Aid

Our Navy Department spends a good deal of money to carry crews which are not actually required in peace time. The engineers of the Navy might just as well run engines on board of a merchant ship. The deck-hands might just as well do duty on a merchant ship, and so might the navigating officers and many other members of the crew.

Certain officers on board of war ships are needed for the distinctly technical work of a war ship; also gunners and men to handle torpedoes and other equipment connected with actual warfare, but these constitute only a small percentage of the total of the crew on board of a war vessel. The duties of the rest do not differ materially from the duties on board of a

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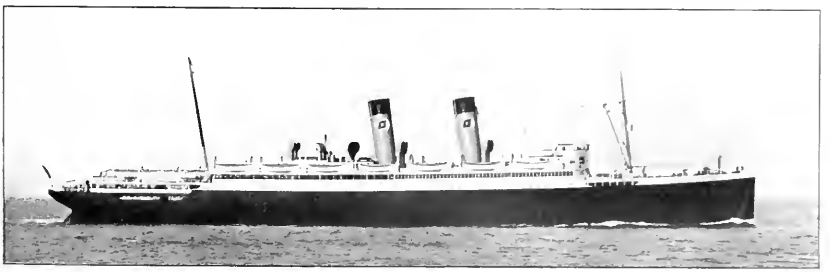


The H. F. Alexander, crack liner of the Pacific Steamship Company

THE MARINE ENGINEER

Some Comments on His Duty to His Ship and His Employer

By T. V. O'CONNOR*
Chairman, United States Shipping Board

THE marine engineer in whose charge is entrusted precious lives and property is also the prime factor in the control of two of the larger items of operating cost—fuel and ship repairs. We are gratified at the improvement recently noted in reports received, but there is much more that can be accomplished. You and I know just what ship repairs can and should be done by the ship's crew. Every self-respecting engineer will see to it that these items of repairs do not appear on his repair list of work to be done in repair yards. He will see to it that every possible repair is made by those aboard ship whose duty it is to keep it in order.

We expect a marine engineer to have a thorough knowledge of all the machinery in his department, and we expect him to utilize that knowledge to the fullest benefit of his employer. This must be done not alone because it is necessary to successfully compete in the foreign trade, but because it is the only honest, efficient and economic method under any condition. Whenever a job must go to the repair yard because too big to be done by the crew, it certainly is the duty of the chief engineer to follow the work to its conclusion and see that his employer gets value received for every dollar spent.

There has been steady improvement, but we are determined upon the maximum efficiency possible with increasing vigilance and scrutiny in all departments of the ships. I know the marine engineer will not be found wanting, but I must say to you that his efficiency will in large measure depend upon the fuel and repair bills of his department. We want the highest possible skill on American ships. We want all possible work done on the ship or in American yards. While I know I need not speak of your duty in this respect, I should say that we are facing a dire necessity that every man shall get down to brass tacks in order to keep the ships running as cheaply as possible in the face of fierce foreign competition. The engineer must have ship pride and ship interest in order to accomplish these things, which shall make it just so much easier to perpetuate our fleet on the seven seas. In doing these things as a duty to your employer, you also may be proud of the fact that you are a part of one of the strongest and most important lines of defense of your government. Do not allow yourself to be deceived into believing that your position is not a permanent one. The American merchant marine is here to stay and to grow with increasing needs.

* Extract from address to the Convention of the Marine Engineers' Beneficial Association, Washington, D. C., January 22, 1924.

LIMITING ECONOMICAL VACUUM

WHEN steam reaches a pressure of two or three pounds absolute, it has expanded to a tremendous volume. In a turbine the low pressure stages can be designed of sufficient sizes to handle this large volume of steam.

In a reciprocating engine the size of the low pressure cylinder would have to be so large that the cost of its construction and the mechanical difficulties encountered would be prohibitive. In the design of some marine reciprocating engines it has not been found desirable to make the steam ports large enough to handle the exhaust from the low pressure cylinder at less than 25 inches. This means that any increase in vacuum over 25 inches merely wire draws the steam in the exhaust ports of the low pressure cylinder, and does not increase the efficiency of the engine. Moreover, the increase in vacuum of over 25 inches in such an engine would tend to decrease the over-all efficiency by cooling down the condensate and lowering the resultant temperature of the water to the feed heater, and by causing more steam than was required to be used in the air pump and circulator.

The most economical vacuum for any particular installation can only be determined by careful record and close observation of operating data. All engineers should keep this fact in mind and devote constant attention to the determination of the proper vacuum to obtain the most efficient and over-all economy in the operation of the installation under their supervision.

TWO LARGEST DRYDOCKS

Financed by the Dominion Government of Canada, two gigantic graving docks have been projected, one at St. Johns, New Brunswick, the other at Victoria, British Columbia. The docks are practically of identical construction. The one at St. Johns has been finished and was opened October 29, 1923. Work is now being rapidly pushed on the Victoria dock. The dimensions are:

Length on keel blocks	1150 feet
Width at bottom of entrance	125 feet
Draft over sill at high water	42 feet
Height of sill over dock bottom	4 feet 6 inches

Our illustration shows excavation and concrete work at Victoria. The estimated cost of this dock is close to $6,000,000.

Oil Engines and Motorships

MOTORSHIP AND DIESEL ENGINE PROGRESS

The Edmonds' Bill in the House of Representatives which will make possible a loan fund for the purpose of assisting in the conversion of steamers to motorships was in a fair way to be approved and passed but is now liable to be overshadowed by the naval oil scandal. Every friend of the American merchant marine should immediately write representatives and senators urging the passage of this legislation, so that America may substitute modern motorships for her antiquated steam tonnage.

PROBABLY the most important motorship product of the month in America is the cargo vessel Challenger. This freighter, bought by the Sun Shipbuilding & Drydock Corporation from the United States Shipping Board, was a single screw steamer of 11,700 deadweight tons capacity Her steam drive has been entirely removed and in its place there has been installed a 3000 horsepower Sun-Doxford diesel engine directly connected to the propeller shaft, and three Worthington 100 horsepower diesel engines directly connected to three Westinghouse 65 kilowatt generators. All the auxiliaries in the ship are motor driven, 40 Westinghouse motors aggregating about 900 horsepower being used for this purpose. The motorship Challenger thus represents the most extensive conversion of a Shipping Board vessel thus far attempted.

No pains or expense have been spared in giving the vessel the most up-to-date equipment for all purposes. She is to have a complete Sperry gyro-compass equipment, consisting of a steering repeater, bearing repeater and course recorder. She will also be fitted with a Sperry helm angle indicator system.

The Challenger will probably make as her initial voyage a round-the-world trip, her first cargo being products manufactured by the United States Steel Products Corporation destined for Singapore, which she loaded at Philadelphia January 31 and from thence she proceeded to New York and Boston for further loadings of shipments consigned to Honolulu, Manila, Java and Singapore. Her first trip, therefore, will be a thorough test-out of the entire equipment.

Such excellent fuel economy records were made by the two tankers Miller County and S. S. Bidwell, in which the same 3000 horsepower Sun-Doxford diesel engines replaced the former steam plants, that the performances of the Challenger will be followed with a great deal of interest by steamboat owners. In the two tankers one boiler was left in place, the cargo pumps being operated by steam, and therefore it was not possible to show full motorship economy. The Challenger with her complete diesel power equipment should demonstrate a largely increased saving in operating expenses.

This vessel, together with the four splendid cargo motorships put out by William Cramp & Sons Ship & Engine Building Company, the William Penn, Californian, Missourian and Seekonk, will give American steamship owners a wonderful opportunity to observe closely at first hand under American operation the possibilities of economy in the diesel drive, and we venture to predict that the results of such observation will be an increased demand for Shipping Board hulls for conversion purposes.

Diesel-Electric Tugs

Three tugs are being built for the Atlantic Refining Company by the Staten Island Shipbuilding Company. The principal point of interest in these vessels lies in their diesel-electric machinery and in the fact that on each there will be installed a large pump for fire fighting purposes. Power for driving this pump will be taken from one of the main generators. The electrical equipment consists of two 155 kilowatt, 257 revolutions per minute, 125 volt main generators, each direct-connected to an Ingersoll-Rand engine. The two generators will be connected in series and will drive a single propelling motor of 370 horsepower, 120 revolutions per minute. There will also be two auxiliary generators direct-connected to the main engine generators, each having a capacity of 26 kilowatts. One of these will be used for furnishing excitation for the propelling equipment, the other for driving auxiliaries.

Motorships of the World

According to B. V. York of the transportation division of the Department of Commerce, the world tonnage of full power ocean-going motorships of 2000 gross tons and over aggregated one million tons on June 30, 1923, and is increasing at the rate of about 5 per cent as compared with June 30, 1922. It is significant, however, that motorships of 5000 gross tons and over had increased by 10 per cent and amounted to two-thirds of the total. The United States is listed with 29 motorships of 2000 gross tons or over, aggregating 99,151 tons, while the United Kingdom had 48 such motorships aggregating 311,365 gross tons.

In motorships of 1000 deadweight tons' capacity and over, recent listings show that there are on order or building in the shipyards of the world 154. This number includes 9 passenger liners aggregating 144,000 gross tonnage and the remainder are cargo ships or tankers with a deadweight capacity of 1,015,000 tons. It will thus be seen, if all of the orders now on hand be carried out, we may expect a very much larger increase in the rate of progress by which the motorship is overtaking the steamer in the fleets of the world. It might be well to notice a few of the more important installations included in the above listings.

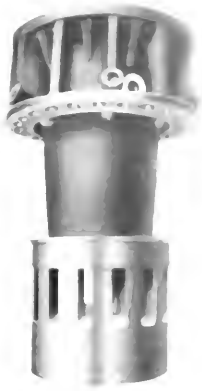
(Continued on page 172)

BETHLEHEM STEEL'S NEW OIL ENGINE

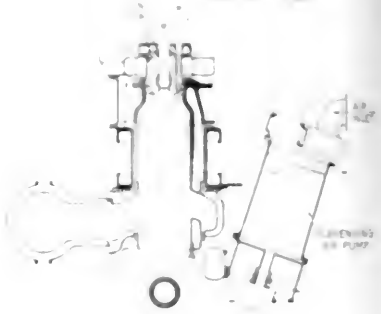
Setting Forth Many Important Features in Design in This New Two-Cycle Oil Engine, Which Has Passed the Experimental Stage and is Now a Demonstrated Success in Both Land and Marine Service

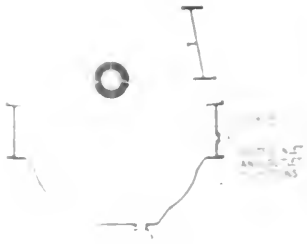
BY THE TECHNICAL DEPARTMENT OF THE BETHLEHEM STEEL COMPANY

W[illustrated by a 6-cylinder engine in regular operation in our Bethlehem plant, developing alternating current in connection with a number of gas engines. The first engine to develop turning moment in marine service is that of the motorship [illegible] with a 6-cylinder, 2-cycle engine developing 2500 shaft horsepower. The engine operates with the propeller shaft down to 20 r. p. m and can be reversed without the aid of a flywheel. The engine's torque has particularly good application, in that it [illegible] of the line, thrust, and



[illegible] stream to oil engine [illegible] to our merchant [illegible] the Bethlehem engine without having to [illegible] thrust and pro-





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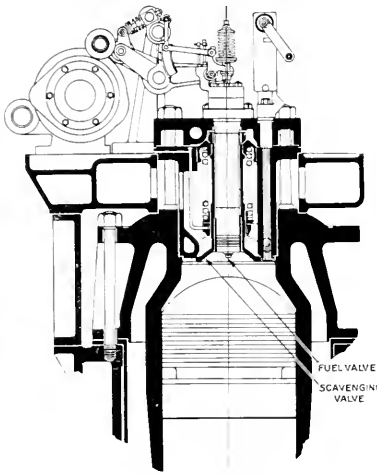

Fig. C—Section through cylinder head and valve mechanism

Cylin

The basic idea s to cr te
an engine in wh all par subject to flame temper-
atures would be esigne s to be able to resist suc-
cessfully for an finite t e the combination of tem-
perature and p re str s inseparable from the
operation of oil nes un r heavy load.

To accomplis s obje the power cylinder was
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subjected to t nside d water outside, and since
the outer cylin wall is ubjected to water temper-
ature on insi d engi room temperature on out-
side, it is evi hat su differential expansion be-
tween inner a outer lls must inevitably occur.
These expans fferen in length increase as the
stroke and c dent l th of power cylinder in-
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carefully plan o avo trouble from this source.
As the photo w hows, e cylinder is cast with the
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Fig. A, but n on sectional drawing B.
This cylinder permits the cores to be ac-
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By reference to section
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the cylinder barrel or exhaust ports, so that all dang
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it is evident that the explosion pressures acting
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is then almost certain to crack the cylinder somewh
through these ports, which are of course the weak
part of any cylinder subject to axial stresses. In pr
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stresses do not exist to some extent. Our construct
avoids this danger by entirely doing away with ax
stresses in cylinders.

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very short space of time. The greater the wall th
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BETHLEHEM STEEL'S NEW OIL ENGINE

Setting Forth Many Important Features of Design in This New Two-Cycle Oil Engine, Which Has Passed the Experimental Stage and is Now a Demonstrated Success in Both Land and Marine Service

By THE TECHNICAL DEPARTMENT, BETHLEHEM STEEL COMPANY

WHEN it has been demonstrated that an oil engine can be maneuvered with more ease and speed than a steam engine designed for the same service; when three years of experience under exacting service conditions have shown beyond question that the engine is at once unusually simple, strong, economical, reliable and easy of access for repairs; and when the engine is not only an improvement on European models but the first oil engine of all-American design, it naturally merits attention.

Fig. A—Power cylinder

The new Bethlehem oil engine is the logical outgrowth of fourteen years' experience with gas engine power plant practice on an unusually large scale, using units of 5500 horsepower each, for the most part, under the hardest possible conditions of continuous steel mill service. More than 200,000 horsepower of large internal combustion engines have been designed by Bethlehem engineers and installed in Bethlehem plants.

This oil engine is the newest development and has been given a thorough try-out in both land and marine service. About three years ago one of these engines was installed in the Cubore, a 10,500-ton motorship belonging to the Ore Steamship Corporation, a subsidiary of the Bethlehem Steel Company. As a result of this experience minor changes were recently made in the engine and on February 9 a number of experts prominent in the marine world were given an opportunity to see what it would do. The results were perfect.

Another engine of the same type is installed in and has been in successful operation at the powerhouse of the Lehigh plant of Bethlehem Steel Company for over a year.

Description

The important features of the Bethlehem oil engine are fully illustrated in the accompanying drawings and photographs. It is of the vertical, 2-stroke cycle, single-acting type, constructed in units of four, six or eight cylinders as listed in table at end of this article, running at a speed of from 116 r. p. m. for land power and twin screw marine purpose, down to 90 r. p. m. for single screw marine use. The number of power impulses given to the crankshaft per revolution is equal to the number of cylinders, thus giving a more even turning torque than would a 4-stroke cycle engine. In the latter engine the number of power impulses given to the crankshaft per revolution is equal to one-half the number of cylinders. This even torque of the 2-stroke cycle type makes the engine very steady in its operation, as is illustrated by a 6-cylinder engine without flywheel in regular operation in our Bethlehem power station producing alternating current in parallel with 40,000 horsepower of gas engines. The effect of this regularity of turning moment in marine service is illustrated by the case of the motorship Cubore, which is equipped with a 6-cylinder, 2-cycle oil engine of our design developing 2500 shaft horsepower, at 90 r. p. m. This engine operates with the utmost success at all speeds down to 20 r. p. m and under all marine conditions without the aid of a flywheel. This regularity of turning torque has particular advantages in a marine installation, in that it permits a reduction in the size of the line, thrust, and propeller shafts.

In the conversion of ships from steam to oil engine drive, a matter of utmost importance to our merchant marine, costs are reduced because the Bethlehem engine can be installed in most cases without having to increase, and therefore renew, the line, thrust and pro-

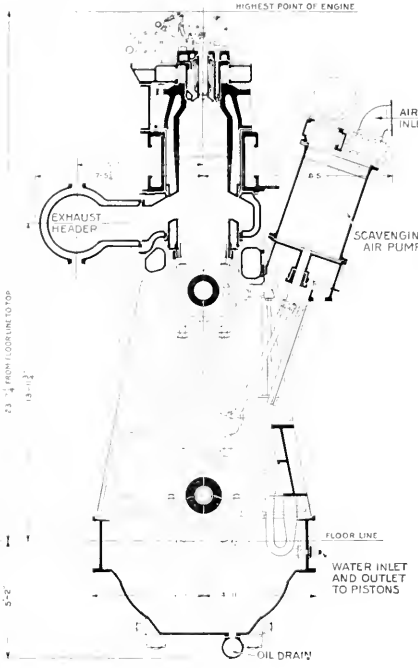


Fig. B—Sectional elevation

peller shafts already in the ship. This is an important factor in selecting a diesel oil engine for marine conversion work. The engine here described is, as before stated, of the 2-stroke cycle (called hereafter 2-cycle) vertical, single-acting crosshead type, the scavenging air being admitted through one valve in top of cylinder, and the exhaust gases passing out through a ring of ports extending entirely around the circumference of lower end of cylinder.

Power is produced by the combustion of liquid fuel delivered into the cylinders in a highly atomized state by the aid of compressed air. The combustion cycle is of the full diesel type. The cylinder air charge is compressed to such a pressure that the heat of the air is sufficient to ignite the atomized fuel when sprayed into the cylinder.

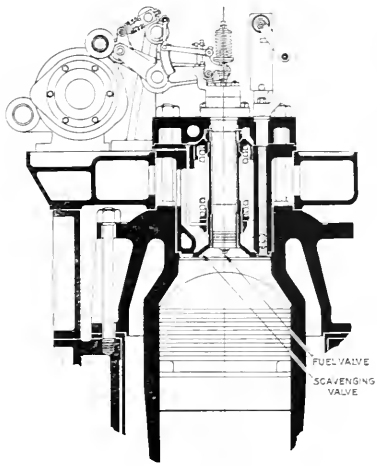


Fig. C—Section through cylinder head and valve mechanism

Cylinder

The basic idea was to create an engine in which all parts subject to flame temperatures would be so designed as to be able to resist successfully for an indefinite time the combination of temperature and pressure stresses inseparable from the operation of oil engines under heavy load.

To accomplish this object the power cylinder was designed as indicated in accompanying photograph A and section through engine B. It will be seen that the inner and outer cylinder walls are united only at the top and at a point entirely removed from heat of combustion. By means of the flanges shown, the cylinders are mounted in pairs in a casting designed to receive them. The power cylinder projects downwardly through this casting, to which it is attached only at the upper flange. Consequently the cylinder is free to expand in all directions without setting up stresses in any working part. Since, as previously explained, the inner and outer cylinder walls are only attached at upper end, it is evident that the inner and outer walls may expand at different rates without setting up any temperature stresses in power cylinder. Since in any internal combustion engine the inner cylinder wall is subjected to flame inside and water outside, and since the outer cylinder wall is subjected to water temperature on inside and engine room temperature on outside, it is evident that such differential expansion between inner and outer walls must inevitably occur. These expansion differences in length increase as the stroke and consequent length of power cylinder increase. The construction of the Bethlehem engine is carefully planned to avoid trouble from this source. As the photo well shows, the cylinder is cast with the water jacket space very open and accessible. This opening in the outer jacket wall is closed by a light cast iron sleeve attached to the lower cylinder at itupper end by a flange and provided at its lower end with a water joint permitting axial expansion without danger of leakage. This sleeve does not appear in Fig. A, but is well shown on sectional drawing B. This cylinder construction permits the cores to be accurately supported and provides for the adequate inspection and cleaning of every square inch of the water-jacketed surface. It will be noted that exhaust ports are cast integrally with the cylinder barrel, thus avoiding any joint between cylinder barrel and exhaust ports. Such a joint, if present, would have to hold hot gases on one side and water on the other. In using fuels high in sulphur, this element will also of course be present in engine exhaust, and the slightest water leak through such a joint would produce troublesome corrosion. It seems best to us to avoid this risk by using a construction not requiring a joint of this kind.

By reference to sectional drawing B it will be seen that the cylinder is held down to its cylinder support by studs passing through the two upper cylinder flanges. The combustion pressure in any power cylinder is exerted downwardly on piston and upwardly on cylinder. With our construction this pressure passes directly to the cylinder flanges and studs and so to the cylinder support, which is held down to A frames and bed-plate by means to be hereafter described. With the construction shown it is evident that no axial tension stresses whatever pass through the cylinder barrel or exhaust ports, so that all danger of the cylinder castings being cracked due to the working stresses set up by the explosion pressures is eliminated. If any cylinder provided with a belt of exhaust or inlet ports is bolted down by its lower end, it is evident that the explosion pressures acting between piston and upper part of cylinder must create axial stresses passing through bridges between ports. If any shrinkage stress exists in the casting it is most likely to be found near these ports. The working stress is then almost certain to crack the cylinder somewhere through these ports, which are of course the weakest part of any cylinder subject to axial stresses. In practice it is impossible to make sure that such shrinkage stresses do not exist to some extent. Our construction avoids this danger by entirely doing away with axial stresses in cylinders.

In the two previous paragraphs we have explained how we avoid stresses due to temperature and axial stresses due to combustion in cylinder. This pressure also produces stresses tending to burst the cylinder. Thee bursting stresses cannot, in an internal combustion engine, be safely reduced by increasing the thickness of the cylinder walls, because each square inch of the wall, particularly at upper end of cylinder, must pass a large amount of heat to the water jacket in a very short space of time. The greater the wall thikness, the greater the consequent difference between the temperatures of inside and outside surface of cylinder walls. The greater such difference in temperature the quicker a cylinder will fail due to heat fatigue.

The practical success of an internal combustion engine depends upon the avoidance of such heat fatigue stresses, and the necessity of care and skill in the design of cylinders naturally increases with the size of same, since thickness of walls must increase with di-

ameters of power cylinders. To cover this point the Bethlehem power cylinder has been designed as shown in Section B and in large scale in Section C. It will be noted that upper part of cylinder is contracted from diameter of bore to that of inlet valve cage. This form, as compared to an open ended cylinder, greatly increases the strength of cylinder without necessitating an increase in thickness of cylinder walls. A practical instance of the increase in strength gained by the adoption of this form is found in the ordinary steel bottle containing gases under very high pressure, such as oxygen or carbonic acid gas. It will be noted from Figs. B and C that our cylinder wall thickness is very uniform in all that portion of cylinder subject to maximum temperature and pressure, the wall thicknesses decreasing with the lower pressures in lower part of cylinder. Such uniformity in section causes uniform change in shape when heated.

The part of the cylinder subject to greatest heat is that portion between lower end of inlet cage down to that portion of cylinder wall covered by packing rings when piston is at or near top center. By reference to Fig. C it will be noted that this portion is very efficiently cooled by water jacket, which extends to a point of the cylinder wall above the bottom of inlet cage. The hot cylinder walls, thus efficiently cooled by water, are also cooled on the inside surface by the scavenging air. This enters through a mushroom-shaped scavenging valve. The shape of the cylinder is so designed that the incoming current of scavenging air passes directly along this heated wall surface, thus absorbing from it a very material amount of heat in addition to that passing to the water jacket. The hottest portion of the cylinder walls is thus practically freed from the danger of heat fatigue for three reasons: first, cylinder walls are very strong form, with very moderate and uniform thickness in upper portion; second, cylinder walls are very efficiently water cooled; third, cylinder walls are positively air cooled on their inside surface by the scavenging air. It should be especially noted that cooling done by the scavenging air not only helps to maintain the cylinder wall at a safe temperature, but that it also thereby increases the efficiency of combustion, since all the heat absorbed by the air from the cylinder walls is added to the working cycle of combustion.

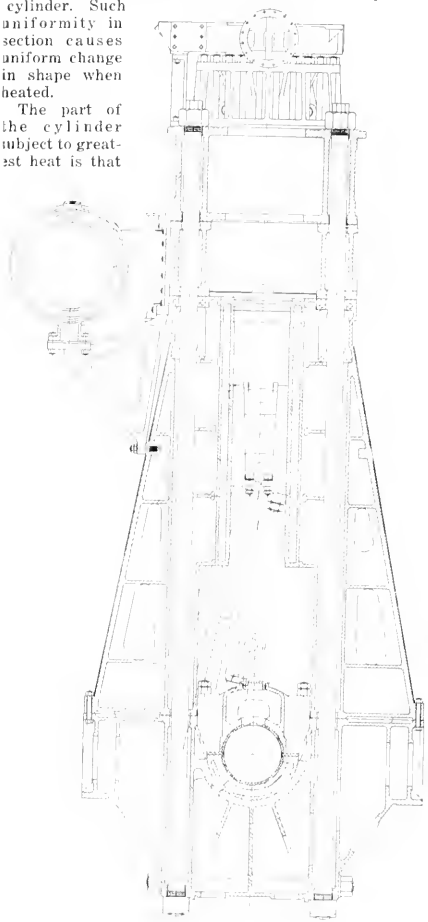
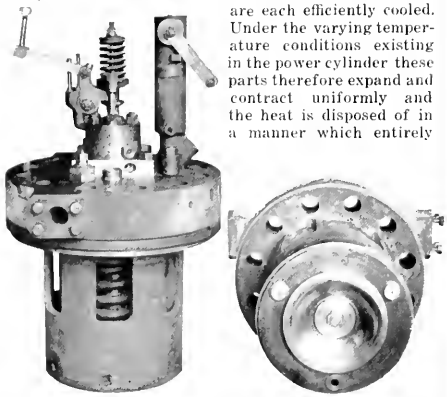


Fig. D—Section showing frame construction

Other Heated Parts.

It will be seen that the only other parts exposed to maximum temperature and pressure are the power piston, inlet cage, scavenging valve and fuel valve. Of these, the piston, inlet cage and fuel valve are water-cooled, while the scavenging valve is positively cooled by the incoming scavenging air, which thereby gains heat and efficiency in same manner as described for cylinder wall. The perfection of cooling of scavenging valve and the seat against which it bears is well illustrated by the fact that during a period of more than three years' operation of these engines at heavy loads we have never been able to detect any ill effects due to heat on these parts. The same remark is true of the fuel valve. We desire to call special attention to the fact that all parts subjected to heat, viz., cylinder, piston, inlet cage, scavenging valve and fuel valve, are all exactly symmetrical with reference to the axis of cylinder, have each a uniform wall thickness, and are each efficiently cooled. Under the varying temperature conditions existing in the power cylinder these parts therefore expand and contract uniformly and the heat is disposed of in a manner which entirely



Figs. E and F—Side and end elevation of the Bethlehem valve cage, which contains all of the valves necessary for the operation of each power cylinder

Motorship Cubore of the Ore Steamship Corporation [illegible]

prevents heat fatigue of any part. During three years' hard service it has never been necessary to replace any part on this account.

Removal of Parts

It should be especially noted that absolutely all working parts except piston, necessary for the operation of a power cylinder, viz., fuel valve, scavenging valve, air starting valves and relief valve, are contained in a single compact and easily removable cage, well shown in Figs. E and F. Any practical man will readily appreciate the value of this construction.

General Construction

Having thus described the effect of combustion on parts exposed to heat it is necessary to trace the action through the engine of the pressures generated by such combustion, which takes place as follows: Let us start with the piston on top center, at which point atmospheric air has been compressed to about 450 pounds per square inch. Into this compressed air, and in the axis of power cylinder a charge of fuel is blown by means of injection air in such a way that we secure thorough atomization of the fuel, which in its finely divided state is ignited by the heat due to compression of air in cylinder. Pressure is thus generated, not instantaneously, but at a rate proportional to that at which fuel is introduced. This pressure is transmitted downward to crankshaft and bedplate through piston, piston guide, crosshead and connecting rod. The pressure which acts downwardly on piston also acts upwardly on cylinder, this being transmitted, as previously described, to the cylinder support to which cylinder is bolted. This cylinder support contains a pair of power cylinders and rests on three A frames, to which it is rigidly held by six long bolts passing from top of cylinder support through A frames and bed-plates. This construction is well shown in accompanying drawings B and D. When engine is erected, these long bolts are tightened so as to produce an initial tension in same about 25 per cent greater than the maximum tension actuating from combustion pressure in cylinder. The bolts are of such a size that this initial tension is not more than 20 per cent of the elastic limit of the material. Since the initial tension in bolts is more than the maximum tension due to combustion pressure, it follows that the bolts do not stretch in the slightest degree while engine is working. The A frames are therefore always in compression. Since cylinders are held to bed-plates [illegible] these large bolts passing through A frames, it follows that the latter can never be subjected to tension under any circumstances. This construction gives the utmost rigidity with a little weight, because the cast iron A frames need be designed only for compression, since the large bolts absorb all the working stresses, producing tension, leaving the A frames subject only to compression stresses due to initial tension of bolts, weight of parts supported by frames, and on a ship, to such stresses as are due to the rolling of vessel, these latter being a small percentage of the combustion stresses.

In the ordinary oil engine construction the power cylinders are bolted to the A frames, the feet of which are bolted to bed-plates near outer edge. This arrangement subjects the whole width of bed-plate to bending stresses arising from combustion pressures, with the deflection of bed-plate consequent thereto.

Bed-Plate

By reference to Figure D it will be seen that in our design these large bolts pass close through the bedplate quite close to main bearing, the distance from center to center of bolts being less than half the width of the bed-plate. Since the part of the bed-plate subject to stresses arising from combustion pressures is only the portion between these bolts, it follows that the span of bed-plate subject to such stresses is less than half the stresses in bed-plate, being consequently less than one-quarter, and the deflection of bed-plate less than one-eighth of those encountered in the ordinary design.

The combustion pressure on power piston acting on bed-plate naturally set up tension stresses in lower side of bed-plate between the large bolts. To resist these tension stresses the bed-plate is provided in its lower part with the horizontal bolts shown in Figure B and D. During erection these bolts are subjected to an initial tension about 25 per cent more than the maximum stress due to combustion pressure, the same as described for the large vertical bolts. No deflection of bed-plate can therefore occur and there is no possibility of a cracked bed-plate due to shrinkage strains in same. It will be seen from the above description that no part either of the A frames or bed-plates is subject to tension, such tension stresses being exclusively taken by properly designed forged steel bolts, leaving to the cast iron parts only compression stresses, to resist which cast iron is well adapted. Since the cast iron parts are relieved of tension and the forged

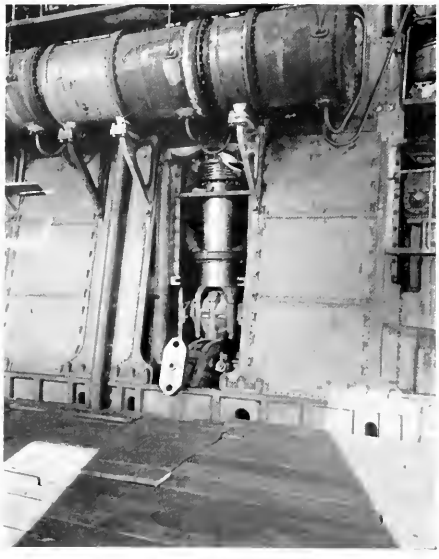
steel tension members are designed for and tested at stresses materially exceeding those resulting from the maximum load for which the engine is guaranteed, it follows that no failure of these parts in service is possible.

Scavenging

Perfect combustion in any oil engine requires that the power cylinders be efficiently cleared of exhaust gases. The clearance space in a 4-cycle engine cylinder, amounting to about 7½ per cent displacement, cannot be cleared of exhaust gases. Due to the fact that at the end of exhaust stroke these gases must be at a pressure above atmosphere great enough to expel the gases from the exhaust pipe, it follows that in even the most carefully designed 4-cycle engines a material percentage of the suction volume of cylinder is occupied by exhaust gases, whose presence is necessarily detrimental to combustion. In our design of 2-cycle engine the scavenging air enters through a central scavenging valve in extreme upper end of cylinder, forming an axial column which entirely fills the power cylinder and drives before it the burnt gases, which escape through very liberal exhaust ports located around the entire circumference of lower end of power cylinder. It will be evident that this construction must perfectly and positively clean the cylinder of all burnt gases. When using low grade fuels a certain amount of residue is sometimes deposited on top of pistons. With our construction such residue deposited in any stroke is, at the end of this same stroke, positively blown out into the exhaust passages before it has time to be hardened by heat. In any design in which gases are exhausted from the upper end of cylinder it is evident that such residue cannot be so expelled and is therefore apt to be burned on the piston and rings. The hard deposit thus formed sticks the rings and greatly increases the cylinder wear. It should also be noted that with this system perfect scavenging can be obtained, no matter how long the stroke may be for a given cylinder bore. The small bore long stroke engine is more economical in fuel and lower in repair cost than an engine of the same cylinder displacement and piston speed, but in which the stroke and bore are more nearly alike, thus necessitating a higher r. p . m. The gain in economy and repair costs by building an engine of a given horsepower of small bore, long stroke and low revolutions has always been evident in steam reciprocating engines, but is still more important in internal combustion engines, due to the higher temperatures and pressures necessarily employed.

Engine Speed

For oil engines employed for marine service there is an additional reason for slow revolutions, because in this way a better screw efficiency can be obtained. Our type is thus especially adapted for this service. For merchant marine ships single screws are cheapest and most efficient. This condition, together with the required slow revolutions, is best filled by the 2-cycle engine, since the 4-cycle engine will not furnish the necessary power to a single screw without increasing the engine speed beyond the economical limit in screw speed, solely to help the 4-cycle engine deliver the power. For this reason most merchant ships driven by 4-cycle engines are of the twin screw type. The same shaft horsepower can be delivered by a single 2-cycle engine, thus making possible a far simpler and cheaper power plant in the ship. It is worthy of note that the 2-cycle engine is especially adapted to drive a screw because the efficiency of both engine and screw increase as the r. p. m. decrease.



View showing piston ready for removal

Injection Compressor

Injection air is supplied by a 3-stage air compressor driven from a special crank on one end of the crankshaft. Particular care has been taken in designing this compressor to assure reliability in continuous service under both land and marine conditions. The use of compressed air for fuel injection gives better atomization and combustion economy over a much wider range of fuels, particularly among the heavy and cheap grades, than any other injection system yet developed. We have used with entire success distillate fuels down to 16 degrees Baume.

Regulation of Injection Air

Our engineers, looking for refinement of control and economy at all speeds and power, have developed a system of fuel valve lift control. This permits the lift of all fuel valves to be quickly regulated from zero to full lift at any moment by the operator when maneuvering the engine. The proper air and oil ratio may therefore be maintained under all conditions. When maneuvering a marine engine or when starting up a land engine, the injection air may be conserved and used in the proper amount, instead of in excess as is the case with a constant lift fuel valve.

Removal of Pistons

A simple device is furnished with the engine for removing pistons from the bottom of the cylinders without disturbing any of the valve gear or piping on top of the engine. The advantages of this construction have been proved by extensive operation under both land and marine conditions.

(To Be Continued)

WORKBOAT AND PLEASURE CRAFT POWER

All motorboat and pleasure craft users will be delighted to know that under the present program for tax reduction, as recommended to Congress, the 10 per cent luxury tax is to be removed. This tax has been a very great handicap on American boatbuilders and boat owners for the past five years, and undoubtedly its removal will prove a great stimulus to the motorboat trade. Every motorboat owner and builder should write his representative at Washington urging the retention of this clause in the present tax legislation.

TUG JUMBO

THE diesel-engined towboat Jumbo, said to be the largest diesel-powered tug in America, was recently completed by the New London Ship & Engine Building Company and placed at work in New York harbor under the Transmarine Corporation.

This company has already in service five diesel-engined towboats, three of which are powered with 180 brake horsepower Nelseco diesel engines and two with 240 brake horsepower Nelseco diesel engines.

The Jumbo has the following general dimensions:

Length 100 feet; beam 26 feet; draft 10 feet forward, 12 feet aft; speed, running light, about 13½ knots. The engine room installation consists of one 600 brake horsepower Nelseco diesel engine, directly reversible and connected to a bronze propeller. The auxiliaries consist of one circulating water pump; one lubricating oil pump; one fuel oil transfer pump; one bilge and fire pump.

A 110-volt, 128-ampere storage battery furnishes power to drive auxiliary pumps, lighting, steering gear, and gypsies for holding in line. The gypsies, or towing machines, are electrically operated.

One auxiliary set consists of a 7½ horsepower engine, directly connected to 5 kilowatt generator and auxiliary air compressor. This set is used for charging air bottles, storage battery and operating auxiliary machinery. In addition to this, there is one 5 kilowatt generator, belted direct to main shaft, which is used for charging batteries and operating auxiliaries whenever main engine is in operation.

The steering gear is operated by a 2-horsepower electro-dynamic motor, located directly under the pilot house. Hand steering gear can be instantly thrown in whenever emergency demands. The capacity of the fuel tanks is 14,000 gallons, giving a radius of action of about 350 hours at full power. It is estimated that the cost of fuel for operating this engine is about one-quarter of what it would be if steam were used.

Total number in the crew, if boat is operated 24 hours a day, will be nine men. Sleeping accommodations have been provided for twelve men. The quarters for the captain and the engineers are large and commodious, each stateroom containing running water and wash basin, large clothes closet and cushioned settees. The crew's quarters are exceptionally large, well lighted, and airy. The engine room and engine on this boat are painted white.

The advantages in a boat of this type over one propelled by steam are: elimination of firemen; longer radius of action; constant power at all times; cleanliness; and economy of fuel.

AN INTERESTING LUBRICATING OIL TEST

THE Pacific Diesel Engine Company of Oakland, California, is very proud of the records being established by its engines in lubricating oil economy. This economy was demonstrated to a very marked degree in the shop tests recently carried out by D. W. Dickie of San Francisco on the 200 horsepower engine built by the Pacific Diesel Engine Company for installation in the new dredge tender for the

STANDARD MOTOBOATS

One of the many trends among motorboat designers and builders during recent years has been the tendency to produce standard types in multiple and in forms suitable for modern manufacture in quantity production. This is especially true on the Great Lakes and along certain sections of the Gulf and Atlantic Coasts.

The tendency is largely responsible for motorboat shows, and in the January show in New York many such models were exhibited. We note also in passing that there was a beautiful exhibit of a standard cruiser from Dodge Motorboat Corporation, Detroit, which held a central place at the San Francisco Automobile Show.

In the picture we reproduce on this page is shown an aisle of the New York show featuring the exhibit of the Consolidated Shipbuilding Corporation of New York. This exhibit includes a standard 34-foot play boat, a 35-foot runabout, and a 16-foot yacht tender together with a number of Speedway engines ranging in power from 22 to 300 horsepower.

View at the New York Motorboat Show, featuring the exhibit [illegible] Shipbuilding Corporation of New York

Port of Portland Commission. This dredge tender was described in an article in these columns in the February issue.

The engine is of the 4-cycle air blast injection marine type, with a 300 mm. cylinder bore and 500 mm. stroke, turning 225 revolutions per minute. The tests were run at this speed and with a maximum cylinder pressure of 500 pounds. The result was as follows:

Horsepower 202.32; revolutions per minute 224.8; pounds of fuel per horsepower, 93.375; pounds of fuel per horsepower hour, .4612.

During this test the engine was lubricating with an oil prepared especially for diesel engine lubrication and supplied by Peter Lettich of the California Lubricants Company. The consumption of lubricating oil per horsepower was .1483, or, expressing it in another way, the engine delivered 1364 horsepower hours per gallon of lubricating oil. The highest temperature recorded in the lubricating oil was 88 degrees Fahrenheit and the highest pressure used in circulating the oil was 4.5 pounds.

Under the same conditions a test was run with a good grade of asphalt base lubricating oil and gave a consumption of .2645 gallons per hour, or a delivery by the engine of 726 horsepower hours per gallon of lubricating oil. In either case figures show very good fuel oil economy for the engine and used comparatively they show the importance of proper selection of lubricating mediums for diesel engines.

ENGINE SHOP BUSY

THE Enterprise Engine Company of San Francisco is busy filling orders for its solid injection heavy duty Enterprise diesels. Units for local installation which have recently passed shop tests include a 90-horsepower diesel for the fishing schooner building at the Sausalito yard of Herbert Madden and a 165-horsepower engine for the tug now being completed at the Anderson yards, San Francisco, for A. Paladini Company.

Puget Sound orders have been coming in briskly and at the close of 1923 five Enterprise diesel engines were shipped north, including a 165-horsepower engine for the halibut schooner Seattle, a 90-horsepower engine for a Bellingham tug, a 135-horsepower engine for the schooner Vansee, and a 65-horsepower engine for Maxwell Brothers, Bellingham.

W. J. Donlan, superintendent of the Enterprise Engine Company, reports a good demand for Enterprise gas engines. Recent shipments have been made to San Diego, Alaska, and Seattle.

MOTORSHIP PROGRESS

(Continued from page 165)

In November, 1923, an order was placed with Harlan & Wolf at Belfast by the Union Castle Steamship Company for a motor passenger liner having a gross tonnage of 20,000 with a length of 630 feet, a beam of 73 feet and a depth of 46 feet. The driving machinery for this motorship will be built by Harlan & Wolf and will be of similar type to the double-acting, four-cycle plant developed by Burmeister & Wain, description and illustration of which were published in a recent issue of Pacific Marine Review.

The engines to be constructed by Harlan & Wolf, however, will have 8 cylinders and will drive twin 3-stage air compressors directly from the engine shaft. The power developed will be 10,000 indicated horsepower or around 8000 brake horsepower for each engine. These vessels will be used on the South African run from Southampton to Capetown, which take about 18 days and will be ideal for demonstrating the possibilities of motorships.

It is said that Harlan & Wolf also have an order from the Royal Mail Steam Packet Company for two motor passenger liners of 22,000 gross tons, which will be equipped with the same engines as described above.

The American part of this huge motorship program of world construction consists of ten motorships aggregating 59,500 deadweight tons, or practically 5 per cent of the total program, which illustrates very forcibly the necessity for American merchant marine interests to wake up to the importance of changing over as rapidly as possible to the more economical form of driving power for ships if we are to maintain any competition in the carriage of freight in foreign trade on the high seas.

The Edmonds bill throwing open the Shipping Board construction loan fund by conversion jobs under very favorable conditions supplies a way out which should enable American shipowners to carry on an extensive conversion program. The latest advices from Washington are to the effect that this bill has a strong chance of early passage in both branches of Congress.

AN INTERESTING SALVAGE

AN interesting piece of work was recently carried out at the plant of the New York Harbor Dry Dock Company, Inc., of Staten Island, when the yacht Half Moon, ex Germania, was successfully docked and dismantled.

The lead keel, weighing over one hundred tons, was removed for salvage purposes.

The yacht was built in 1908 in Kiel, Germany, by Bertha Krupp as a present to her husband, who, in turn, made a present of the yacht to ex-Kaiser Wilhelm, who used her until the outbreak of the war.

In 1914, on the declaration of war, she happened to be at Southampton and was captured by the British and sold by them to Christopher Hannevig for $100,000 and later to the Assistant Secretary of the Navy, Mr. Newberry. She is a very fine piece of workmanship, the hull being built of nickel steel and luxuriously appointed throughout. As a sailing yacht she was eminently successful.

Stern of the yacht Half Moon, ex Germania, docked for scrapping at the plant of the New York Harbor Drydock Company.

Economy Through Propeller Design

A RECENT installation made by the Cloverleaf Propeller Company of San Francisco on the towboat Island Empress of the Island Transportation Company of Stockton, California, indicates the possibilities for economy in operation which lie in the field of adequate propeller design and service.

The Island Empress was built in 1917 for tow service on the upper San Francisco Bay and lower San Joaquin River. She is 52.6 feet in length, 14.2 feet beam, and 5.8 feet depth, and is powered with an old style 125 horsepower marine type heavy duty Union gas engine having three cylinders each 13½-inch bore by 16-inch stroke. This engine is one of a pair originally installed in a twin screw lumber schooner about twenty years ago and has seen considerable severe usage during its nineteen years of operation, but is still giving excellent service. This is typical of this rugged type of engine, built to stand up under heavy duty.

The engineers of the Cloverleaf Propeller Company were called into consultation to see what could be done in the way of improving the service of this boat. With her original propeller she had been making the run from Venice Island to Stockton in three hours and on her regular run towing a barge from Stockton to Port Costa her average time was approximately ten hours. A propeller of the Cloverleaf pattern was especially designed for the Island Empress and after its installation she made the run from Venice Island to Stockton in one hour and fifty minutes and ,towing her regular barge, made the run from Stockton to Port Costa in less than eight hours. On both of these runs the engine used less fuel per hour than it had averaged previous to the installation of this propeller.

On this particular job, then, the running time light has been reduced by about 35 per cent and the saving in fuel light is slightly better than 35 per cent. With her full load towing the saving in time of both boat and barge and the saving in fuel in operation of the engine is slightly better than 20 per cent.

It will be easily seen from the above figures that the saving effected on this job would only take a few days to pay for the new propeller. In addition to this saving the Island Empress handles better in every way, especially in maneuvering and steering while going astern.

The Cloverleaf Propeller Company is located at 268 Spear street, San Francisco, where their engineers will be glad to confer with interested parties on savings possible through modern scientific propeller design.

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

THE RAY ROTARY FUEL OIL BURNER

IN 1915 William R. Ray of San Francisco was granted patents for an oil burner of the rotary type comprising many unique and valuable features.

The W. S. Ray Manufacturing Company was organized to produce and distribute this burner, and in the last eight years they have made many thousands of installations for heating buildings, for stationary power plants, and for industrial purpurposes. The engineers of the organization have accumulated a large volume of original data and information relative to the burning of fuel oil under boilers, and as a result have developed many exclusive refinements in design and application.

Ray rotary fuel oil burner of the turbine drive type recently installed on a San Francisco ocean-going tug

As will be seen from the sectional drawing reproduced herewith, the Ray rotary burner consists essentially of a hollow steel shaft with an air fan and an internal cone tip mounted at one end, and the rotor of an electric motor or steam turbine mounted at the other. The oil is introduced in a $\frac{3}{8}$-inch pipe through the hollow shaft, this pipe being arranged to apply the oil on the surface of the internal cone at its smallest diameter.

In operation the hollow shaft with the fan and the burner tip are rotated clockwise at 3000 to 4000 revolutions a minute, so that the oil is flung from the outer edge of the surface of the internal cone in a whirling spray of finely atomized particles. Air is driven by the fan through the annual opening surrounding the atomizing tip, and in this opening spiral vanes are so disposed that this air is given a whirling motion counter clockwise. The air vaning is cut at different angles to meet different furnace conditions.

The effect of this combination is to throw a finely atomized spray of oil whirling at a peripheral velocity of about a mile a minute into fresh air whirling in the opposite direction at an equal or greater speed, with the result that practically complete combustion is obtained.

With the Ray system cold oil of 14 gravity can be burned—in fact the present heating now universally in use can be dispensed with entirely.

Oil pressure of 30 to 50 pounds is ample.

Cleaning or changing of tips is entirely dispensed with due to the large orifice in the Ray burner.

Forced draft is not necessary with Ray installation.

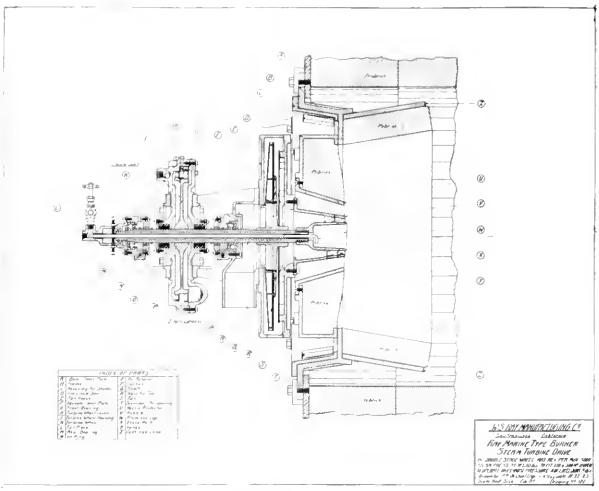
Quite recently an interesting test was made in a large tug on San Francisco Bay. This vessel was notorious as a smoke screen producer and for difficulty in maintaining steam pressure. With the Ray rotary burner installed no appreciable smoke could be observed and constant steam pressure was maintained with a marked improvement in economy of fuel. After 12 days' intermittent operation one of the boilers was opened for inspection and the following conditions observed:

(1) Furnace brick free from any deposit of oil or carbon;

(2) Tubes clean and free from soot;

(3) No defects in burners.

On account of the excellent showing made in these tests the owners of this tug are now considering the installation of Ray rotary burners on another towboat.



Section through the Ray rotary fuel oil burner of the steam turbine drive type

Wooden pattern for the cast steel hawse pipes of the Leviathan in the pattern shop of the Tietjen and Lang plant of the Todd Shipyards Corporation

A Notable Marine Casting

THE largest hawse pipes ever cast in an American foundry have been installed by the Todd Shipyards Corporation on the steamship Leviathan. These pipes weigh nine tons each, measure 18 feet in length and 35 inches in diameter.

The contract for the manufacture and installation of these pipes was awarded Todd's Tietjen & Lang plant after a survey of the Leviathan's hull revealed that the original German made cast iron pipes were badly damaged and that a large fracture in the neck of the flange had developed in the port pipe.

The specifications required each hawse pipe to be made in one piece of cast steel. As no plans were available it was necessary for the pattern makers to make their measurements and construct the template for the patterns from the damaged pipes aboard the vessel.

In small vessels hawse pipes can sometimes be made from heavy steel pipe cut at an angle at one end to conform to the lines of the ship's bows and riveted to the flange. The flare of the Leviathan's bows and the thick walls necessary ($2^{3}/_{8}$ inches) in the curved connection from the flange to the barrel of the pipe, precluded using this method.

The template, which consists of a frame accurately fitted in to the damaged hawse pipe, gives the exact inside dimensions of the flange and the barrel. This frame work after careful fitting was removed to the pattern shop and the work on the pattern commenced. The pattern is simply a wooden reproduction of the hawse pipe and is used in the foundry to make the mold which will receive the molten steel for the casting.

The construction of these two wooden patterns required about 3000 feet of lumber and each weighs about 900 pounds. After they were fitted in place on the Leviathan and the dimensions verified, they were turned over to the foundry and work on the steel castings commenced. Three weeks were required for this job and on completion the finished hawse pipes were removed to the ship, where rivet holes were drilled in the flanges and the hawse pipes installed. The 12-ton anchors were shipped and unshipped and all joints thoroughly tested with a water hose at a pressure of 30 pounds per square inch.

RUDDER INDICATORS NECESSARY

WHILE the result of the several official inquiries concerning the accident to the Leviathan in New York harbor last month have not, as yet, been announced, it is safe to say that with the tremendous size and draft of modern steamships that are expected to enter and leave our harbors with their tedious channels and passageways designed to meet the needs of the smaller and more shallow draft vessels of twenty years or more ago, every precaution, every accessory, every bit of equipment that tends to increase efficiency or facilitate ease of handling and maeuverability must be brought to bear.

Rudder indicators have an important value under conditions of this nature. A vessel entering harbor necessarily has less maneuvering room and therefore must be kept under perfect control, for a vessel traveling at even four knots an hour has little or no time to feel for rudder position. In the case of the Leviathan the channel, being narrow and, due to probably the most peculiar tidal conditions that exist in any harbor on the entire coast line of the United States, is one of the most intricate waterways to negotiate; equipment that gives a visual check on the operation of the telemotor and instantly permits of determining any actual change necessary becomes indispensable in the safe operation of a vessel.

Ships not equipped with rudder indicators are without means of determining the rudder position and make harbor navigation extremely difficult.

Officers navigating vessels traveling in open water, on free route, are finding rudder indicators of constant service and highly economical.

This fact has been proved time and again, for when the course is run and the log is read there is generally an appreciable deviation between plotted and actual positions. Zig-zagging between plotted and actual positions increases voyage time and nautical mileage with its attendant increased fuel consumption.

These factors are admirably expressed in the following paragraphs of the Panama Canal Zone Circular Letter, which read:

"These indicators when functioning will show the helmsman the position of the rudder at all times. The use of the indicator enabling the helmsman to use small helm when in free route should pay for the installation of the indicator in economy of fuel in a short space of time.

"In the future, when the Board of Local Inspectors has under consideration a damage case, the steering gear will be deemed unsatisfactory when there is no telltale visible to helmsman to show him the position of the rudder."

Rudder indicators work both ways and are just as valuable to navigating officers when backing out from landing piers, when rudders can be accurately set to care for currents, as in entering a harbor.

The installation of Cory rudder indicating systems is a comparatively simple matter, so the Cory service engineers advise. Cory installations have been made at shipyards on both coasts as well as with the client's own personnel, and installation effected without interference to scheduled sailings, a very important matter in these days of efficient ship operation.

Performance Record of War Built Ship in Transatlantic Service

	9	10	11	12	13
Voyage No.					
Dates	July 7, 1922	Aug. 9, 1922 to Nov. 6, 1922	Nov. 22, 1922 to Feb. 23, 1923	Mar. 14, 1923 to May 12, 1923	June 9, 1923 to Aug. 18, 1923
Ports	Boston, N. Y.	N. Y., Phila., Medit., Boston, N. Y.	N. Y., Medit., Boston, N. Y.	N. Y., Medit., N. Y.	N. Y., Medit., N. Y.
Total time	72d 6h 0m	89d 20h 55m	92d 2h 26m	59d 19h 18m	70d 1h 30m
Time at sea	47d 20h 32m	49d 21h 31m	52d 21h 14m	45d 1h 6m	46d 9h 52m
Distance covered [illegible]	11,826	11,888	11,611	11,660	11,285
Average speed, miles	9.2	9.9	9.1	10.78	10.13
Revs. per min. [illegible]	81.3	82.6	79.1	84.5	86.0
Revs. per mile [illegible]	7.5	8.3	8.7	6.6	10
Average [illegible]	185	200	195	194.1	192.8
Per cent [illegible]	5.74	7.7	7.71	9.04	8.48
Miles per hour [illegible]	24d 28m	39d 23h 24m	39d 1h 12m	14d 18h 18m	23d 15h 38m
Time in port	440	45	40	57.1	43
Fuel per day in port, barrels	9,951	11,774	11,626	9,540	9,944
Total fuel used, average, barrel	21	18.5	17.5	17.8	19.5
Water consumed per hour in port, tons	12.2	12.6	14	13.7	12
Water consumed per day at sea, tons					

Keep Hulls Clean

IN regard to voyages performed by the United States Shipping Board steamer Hog Island, one of the very fine vessels built during the war, statistics have been published which seem to have given great satisfaction to the Shipping Board. These statistics, however, are causing a certain amount of comment in shipping circles, insofar as the fuel consumption is concerned.

In order to explain the position, we are here reproducing the statistics, and our attention has been called to the fact that on voyages Nos. 10 and 11 the fuel consumption of the vessel has risen to a most remarkable degree over that of voyage No. 9, actually to the extent of 20 and 30 per cent, respectively. In harmony therewith the propeller efficiency has gone down, insofar as the slip on voyage No. 11 was twice as great as on voyage No. 9. We are informed that these facts clearly point to voyages Nos. 10 and 11 having been performed with a foul bottom.

Apart from the cost of 5000 barrels of fuel oil, which represents increased consumption, on voyages Nos. 10 and 11, there is also the loss of time resulting from the reduced speed on these voyages. The total additional expense resulting from this loss of speed and loss of time is probably around $8000 to $10,000, which could have been saved if an efficient antifouling paint had been applied to the bottom of the vessel instead of the material which the Shipping Board is now using, which may be suitable for war vessels moving around the Atlantic and Pacific Coasts of the United States, but which evidently is not suitable for the Mediterranean trade.

While it is very gratifying that in other respects the performances of the steamer Hog Island are so satisfactory, the loss of speed and time and the remarkably increased fuel consumption of this vessel throw a significant sidelight on the management of these vessels by the Shipping Board, for it is hardly to be imagined that a private shipowner would have sent this vessel on voyage No. 11 after she had already consumed an extra 2000 barrels of fuel oil and lost considerably in speed without placing her into drydock and cleaning her bottom and applying to it a paint which is adapted to the Mediterranean trade.

—[Contributed.]

A New Total Flow Meter

THE electrically operated flow meter recently put on the market by the General Electric Company was designed to provide a means for accurate measurement of the total flow of steam, water, air, gas, oil, etc., through pipes. Due to the electrical principle of operation, the indicating, curve-drawing and integrating instruments can be located any distance away from the pipe where the flow is being metered. Instruments can be either separated, grouped or arranged as requirements dictate.

The meter consists of three principal elements: The differential pressure producing device, the cast iron meter body piped to the differential pressure producing device, and the electrical measuring instruments mounted on the panel. The cast iron meter body is constructed in the form of a U-tube. Within one leg of this tube is a coil through which the current flows in its path through the meter body and back to the panel. As the differential pressure increases, mercury is forced up around this coil, acting as a secondary inducing more current in the primary. This increase in current is indicated on the electric instruments and, as the differential pressure bears a definite relation to the flow, the current shown on the instruments will likewise bear a definite relation to the flow.

On the outside of the meter body a small transformer is mounted whose function is to reduce the voltage applied to the internal transformer in the meter body as well as act as an insulating transformer. In series with the primary of this transformer are the adjustable line resistance, voltage regulator resistance and electrical measuring instruments.

When there is no flow of gas or fluid through the main pipe, the electrical instruments indicate the excitation current and the zero readings on the instruments and meters are suppressed so that zero flow corresponds to this excitation current. When the gas or fluid flows through the pipe there is a differential pressure produced by the flow nozzle, causing the mercury in the meter body to rise in the transformer leg and fall in the base until the unbalanced column balances the differential pressure. By proper calibration, the electrical instruments will accurately measure the height of mercury in the small leg of the U-tube containing the internal transformer, which height is a function of the flow of gas fluid in the pipe.

(Section continued on page 40)

TRADE AND TRAFFIC TRENDS

A Department Devoted to the Interests of Exporters, Importers, and All Ocean Shippers

MARKET FOR AMERICAN EXPORTS ON MEXICO'S WEST COAST

Consul W. E. Chapman, Mazatlan, August 27

ABSENCE of direct communication between the west coast of Mexico and other importing centers of the Republic (all intercourse being by steamship to and from Manzanillo and thence by rail inland) establishes an independent trade relation between that coast and the United States. Every steamer arriving from American ports leaves a fair share of its cargo, and every train down the Southern Pacific Railroad of Mexico brings merchandise transshipped at Nogales. Exports to the United States cease, however, almost completely during the rainy season from July to November, except for diminished quantities of gold and silver bullion from the near-by mines. For this reason the rate of exchange on American bank transactions always reaches its height between October 15 and November 15, when the northern movement of tomatoes and other winter vegetables—the chief export crops—begins. The premium during November, 1923, reached as high as 10 per cent.

This situation usually affects American exports to the west coast of Mexico during the latter part of the year, and for that reason it is suggested American exporters with well-established local connections grant credits until about January 1, but only in cases where they believe customers are entitled to such extensions. This will enable importers to make their payments after exchange has taken its usual drop following receipts of payments for vegetables and neutralize the effect of abnormal premiums prior to that time.— Commerce Reports.)

WATERPROOF CASE LININGS IN EXPORT PACKING

WATERPROOFED case lining papers play an important part in export shipping, protecting valuable merchandise against moisture, mold, odors, salt water and other hazards brought about by stowage in the holds of ships or by the varying climatic changes in foreign countries. There are few commodities that water does not injure. Textiles are discolored and decayed, metals and machinery are rusted, foodstuffs are made unpalatable and chemicals are dissolved or changed in their composition. Even canned goods may be made unsalable by the discoloration or loosening of labels. It is therefore necessary that the majority of export cases be lined with a tested paper that possesses the requisite waterproof qualities.

In order to place in the hands of exporters data concerning the best types of case lining papers, the Bureau of Standards, through the cooperation of the paper division of the Bureau of Foreign and Domestic Commerce, has submitted the following:

	TOTAL				IMPORTS				EXPORTS			
	1923		1922		1923		1922		1923		1922	
	Rank	Tonnage	Rank	Tonnage	Rank	Tonnage	Rank	Tonnage	Rank	Tonnage	Rank	Tonnage
New York	1	22,435,617	1	19,000,541	1	11,802,820	1	9,737,070	1	10,632,797	1	9,263,471
New Orleans	2	7,412,517	2	7,860,407	4	3,897,659	3	3,137,165	2	3,514,858	2	4,723,337
Philadelphia	3	6,920,155	4	5,148,280	3	4,083,194	6	2,697,435	4	2,837,961	4	2,477,795
Baltimore	4	6,696,362	3	5,194,615	5	3,412,513	4	3,347,617	3	3,283,849	3	2,846,998
Boston	5	4,758,163	6	3,366,224	2	4,284,744	7	1,926,478	26	473,419	20	439,746
Buffalo	6	3,722,756	7	3,254,237	6	3,207,836	4	2,704,554	23	514,920	17	525,693
Port Arthur	7	3,435,382	5	4,795,339	7	2,287,284	5	3,341,497	12	1,148,158	8	1,453,332
San Francisco	8	3,072,928	11	2,101,028	9	1,154,738	10	785,210	6	1,918,190	5	1,315,818
Galveston	9	2,940,779	8	3,790,818	8	1,614,020	8	1,652,665	7	1,326,759	6	2,187,153
Los Angeles	10	1,850,942	26	554,745	21	320,496	24	132,434	6	1,530,446	26	372,580
Norfolk	11	1,457,058	10	2,203,436	15	371,109	11	521,820	11	1,126,371	11	1,761,437
Cleveland	12	1,391,949	15	911,100	20	238,211	20	179,607	8	1,153,738	14	731,493
Toledo	13	1,313,188	14	974,447	32	48,454	37	7,178	9	1,143,731	11	967,269
Portland, Me.	14	1,236,410	13	944,371	13	664,256	14	463,448	16	656,174	16	480,923
Portland, Ore.	15	1,015,823	12	1,569,462	40	83,711	43	45,744	13	932,113	7	1,523,718
TOTAL		69,060,059		59,334,633		37,396,630		30,668,478		32,443,029		34,358,16
Increase Tons		9,725,526				7,268,041				1,287,378		
Increase per cent		16%				24%				4%		
Percentage of Total Commerce		75%		75%		81%		81%		81%		79%
Total Commerce		92,357,582		79,375,329		46,161,796		36,656,232		46,195,784		43,719,097
Increase Tons		12,982,353				9,493,566				3,469,787		
Increase per cent		16%				26%				8%		

An interesting table, showing a comparison between the foreign trade tonnage of the United States in 1922 and 1923 and the ranks of the principal ports

Tentative Specifications for Waterproof Case Lining Paper

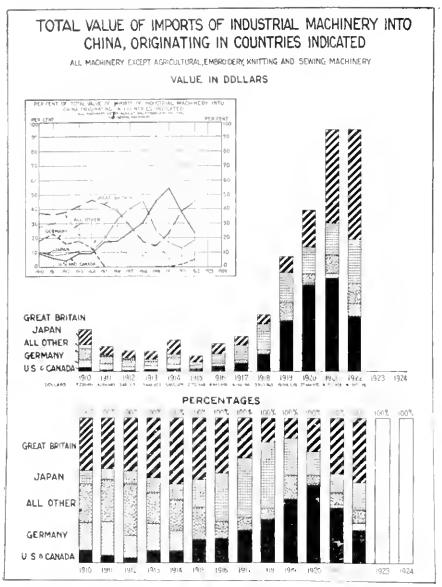
Composition.—The paper shall be made of two layers or sheets of 100 per cent sulfate kraft paper, cemented together with a layer of asphalt.

Weight.—25 by 40, 500, 120.5 pounds basis (24 by 36, 480, 100 pounds). (A tolerance of 10 per cent will be allowed on weight.)

Bursting Strength.—Average of 10 tests shall be not less than 60 points.

Tensile Strength.—Average of 10 tests in both directions of the sheet shall be not less than 9 kilograms.

Water Resistance.—Time of penetration of water shall be not less than one hour.



Diagrammatic representation of industrial machinery trade with China, showing the trend of competition between the various nations engaged

SHIPMASTER'S LIABILITY

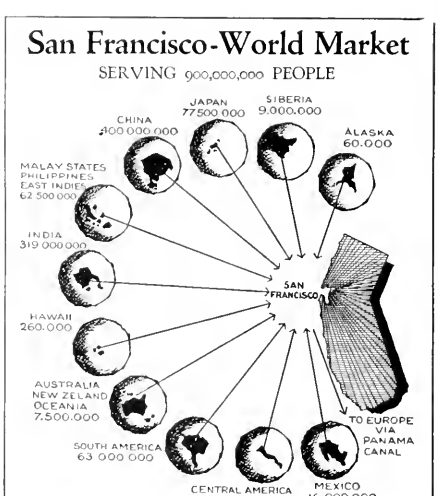
THE Division of Commercial Laws has received from Commercial Attache Edward J. Feely the full report of a case in the Federal court of Buenos Aires, which has appellate jurisdiction in maritime cases, defining the liability of the master of a vessel for damage to the cargo in transit, and fixing the burden of proof in an action in personam against him.

The action was to recover 50 per cent of the value of a shipment of Portland cement, loaded at Norfolk for Buenos Aires, and the defense of the master was that he could not prevent the injury to the cement. The decision of the court was based principally upon Article 918 of the Code of Commerce, which provides that the captain is to be considered the true depository of the cargo and of whatever goods he might receive on board, and as such is responsible for guarding it, for its proper stowage, and for its conservation. This responsibility begins at the time of receipt on board and ends with delivery. The court declares that the master is responsible, under this article, for any damage to the merchandise, unless he can show that it was the result of causes inherent in the goods themselves, os proceeded from force majeure or fault of the shipper. Since the consignee and the shipper have no control over the goods in tansit, nor any opportunity of keeping watch over it, the captain must be presumed to be at fault, so that it is his duty to prove at the trial that the damage proceeded from one of the three stated exceptions that excuse him from responsibility. As no such proof was disclosed in the pleadings and record before the court, the operation of the presumption was unimpeded.

In a concluding paragraph the opinion observes that it makes no difference that the contract of affreightment appears to exempt the captain from all responsibility, because the express article of the code cannot be made the subject of private modifications. The parties cannot contract away a responsibility imposed by law imperatively upon one of them.

Captain Responsible from Time of Receipt to Delivery

In the light of this decision, it is interesting to note the wording of the second paragraph of the article before cited, which, translated literally, reads: "The responsibility of the captain with respect to the cargo begins from the time when he receives it, until the act of delivery in the place which will have been stipulated, or in the usual place in the port of discharge, excepting any express agreements to the contrary."—(Commerce Reports.)



An interesting graph showing how San Francisco is strategically located for the service of the majority of the earth's population. This illustration forms the frontispiece of a foreign trade directory, "Foreign Traders of San Francisco," recently issued by the San Francisco Chamber of Commerce. The book contains descriptions of the facilities and charges at the Port of San Francisco, a list of U. S. Customs bonded warehouses, customs brokers, foreign consuls, and of steamship lines in the foreign trade classed under the country of destination. There is a list of all foreign traders, a commodity section, and import and export sections by countries, the whole being alphabetically arranged. Some 536 firms and individuals are thoroughly classified by this book in their relation to foreign trade.

Countries.	Nine months ended September— 1922	1923
IMPORTS.		
Japan	$299,718,661	$360,884,311
China	95,229,596	140,745,217
Straits Settlements	67,099,911	118,582,458
British India	69,948,811	102,639,087
Philippine Islands	45,744,919	64,673,641
Dutch East Indies	25,171,631	41,390,118
Australia	27,585,047	37,142,489
New Zealand	8,497,254	12,755,174
Other Far East	39,522,568	76,007,905
Total	610,068,228	865,990,611
Europe	653,164,061	861,879,756
North America	644,631,204	774,781,977
South America	231,273,787	377,963,648
Africa	44,017,445	71,469,067
Grand total	2,182,659,475	2,958,185,059
EXPORTS.		
Japan	155,127,603	165,100,765
Australia	57,111,433	87,[illegible]967
China	78,241,543	74,[illegible]5[illegible]
Philippine Islands	31,570,741	53,[illegible]81[illegible]
British India	24,[illegible]541	41,[illegible]135
New Zealand	13,479,131	19,[illegible]217
Dutch East Indies	5,906,454	7,[illegible]742
Straits Settlements	3,070,134	5,[illegible]167
Other Far East	33,[illegible]157	28,[illegible]475
Total	403,[illegible]407	442,[illegible]993
North America	654,[illegible]251	831,[illegible]231
Europe	1,474,[illegible]606	1,411,[illegible]999
South America	161,[illegible]805	264,[illegible]774
Africa	42,[illegible]522	46,[illegible]253
Grand total	2,736,731,692	2,999,[illegible]047

IMPORTANCE OF ORIENTAL TRADE

The above table, taken from Commerce Reports, shows the American Pacific Ocean trade, foreign, as compared with the foreign trade to the other great divisions. The table is for the first nine months of 1922 and 1923. It shows a fairly healthy growth in total value on practically all of the great divisions of our foreign trade. It will be noted, however, that while our imports from Oriental sources and the South Pacific are just about equal to our imports from Europe that exports on the other hand show a very different story. In 1923 we have an import value in European trade of over $864,000,000 and an export value of over $1,400,000,000, while the corresponding totals for the Orient and the South Pacific show over $335,000,000 imports as against only slightly over $424,000,000 exports, apparently a very unfavorable balance of trade with Europe and a very favorable balance of trade, so far as the promotion of foreign trade goes, with the Orient. It would be interesting to know how much of the fourteen hundred million dollars worth of exports to Europe gets to its final consumer in the Orient. This is just another illustration of the necessity of our government encouraging the establishment of American commercial institutions and the underwriting of loans by American capital in Oriental countries.

AMERICAN LAMP EXPORTS

THE United States is lighting the world. Its electric lights twinkle in a hundred different countries, colonies, protectorates, mandated territories and island communities, literally the world over. To Iceland at the far north, to the southernmost communities of Africa, South America and Oceania and to all the countries and colonies lying between those extremes, the manufacturers of the United States are sending millions of dollars worth of electrical lighting appliances.

It appears that the American incandescent lamp finds favor in even the most advanced of the great manufacturing countries, for in 1920 the number of "metal filament" lamps alone sent to England was 507,000, to Belgium 746,000, to Italy 330,000, and to Europe as a whole approximately 2½ million. Canada, which buys freely of all of our manufactures, took in 1920 nearly 4,000,000 incandescent lamps, Cuba took over 2,000,000, Brazil in 1919 took practically 3,000,000, and Argentina 1½ million, while the number taken by Australia in 1921 aggregated considerably over a million. And this use of electric lights by no means is confined to the larger or more advanced countries, for Iceland and the Faroe Islands took in 1919 over 12,000 lamps; Hejaz, Arabia, in 1921 over 3000, Palestine approximately 2000, and our own Virgin Islands over 4000.

This growing use of electric lights the world over illustrates, says the Trade Record, the tremendous development in the utilization of electricity in all the many forms in which it is now made useful to man. This growing world demand for electrical appliances and machinery is evidenced by the fact that our exports of the group officially designated as "electrical machinery and appliances" has aggregated about $650,000,000 in the last dozen years, and the distribution has been absolutely world-wide. The capital of the factories producing electrical machinery, apparatus and supplies is reported by the census as $857,855,000 in 1919 against $83,660,000 in 1899, or ten times as much in 1919 as twenty years earlier. The latest census report shows the total number of incandescent lamps manufactured in the United States in 1921 at 247,000,000 with a total valuation of $59,728,338, as against approximately 100,000,000 in 1914.— Trade Record, National City Bank, New York.)

NEW REGULATIONS AT COLOMBIAN PORTS

DECREE No. 1406 of 1923 regulates the dimensions of freight lists, invoices, manifests, ship's crew lists, applications for unloading permits and other documents which must be presented to the Colombian customs and which, under the stamp tax law No. 20 of 1923, are subject to a stamp tax of 50 centavos. The freight lists and manifests are to be made out on paper not exceeding double the dimensions of stamped paper, and the other documents on paper of the regular size. Documents violating these instructions may be legalized upon the affixing and canceling of a stamp of the value of 10 pesos on each sheet.

The dimensions prescribed by the stamp tax law for stamped paper are a length of 32 centimeters and a width of 22 centimeters, with a left margin of 3 centimeters and a right margin of 2 centimeters. Accordingly this decree requires that freight lists and manifests do not exceed 64 centimeters in length and 44 centimeters in width with margins the same as those for stamped paper.

The consul general of Colombia explains that the term "manifests," as used in the decree, refers to clearance documents made out at the Colombian customhouse, and that therefore only one document legalized by the consul at port of shipment, that is, the "freight list," also called "manifest," may be of double the size of stamped paper. The "regular" size to which the other documents must conform is explained by the consul general to be the size prescribed for stamped paper.

Although not specifically enumerated, it is understood that bills of lading are subject to the requirements of this decree as included among the documents required for presentation at the Colombian customs.

Imported merchandise left in bond in customs warehouses or the offices of foreign parcel post in Colombia may be reexported without the payment of import duties, upon the payment of storage charges, according to a provision of Law 102 of December 4, published in Diario Oficial December 11, 1923.— Commerce Reports.)

TRACKAGE FACILITIES NECESSARY FOR SUCCESSFUL AND ECONOMICAL OPERATION OF A PORT

By G. B. HEGARDT*
Chief Engineer and Secretary, Commission of Public Docks, Portland, Oregon.

ADEQUATE trackage for terminals is one of the most vital, and generally one of the most neglested functions, connected with terminal operation, and we have attempted to solve this problem on a rather extensive scale at our Terminal No. 4, where the trackage system, while quite extensive at present, is hardly sufficient to fill requirements. We have there at this time fifteen miles of tracks, but have made provision on the extensive terminal site to put in a total of thirty miles.

In 1917 the people of Portland had voted an additional $3,000,000, with which to construct a grain elevator and provide further facilities for the port. The matter of obtaining a suitable site was the first important question to be decided, and in order to make the best possible selection of such a site the commission asked the presidents, or their representatives, of all the railroads centering in Portland to meet with the commission for the purpose of getting their views as to the best location of a site for the proposed large terminal, where, as far as possible, would be minimized the congestion which already existed in the railroad terminal yards, and at the same time obviate the crossing of bridges with freight cars destined to the new terminal.

At this meeting the first matter taken up was whether the railroads would agree beforehand that the railroad, on whose trackage this terminal was finally located, would perform the switching service to the terminal for competing lines at actual cost. This was agreed to, and after various sites had been discussed, the present site of Terminal No. 4 was unanimously approved as best fulfilling all these conditions.

The terminal yards of the four transcontinental railroads entering Portland are located on the same side of the river as Terminal No. 4. The site acquired contained 160 acres, and five additional acres were later purchased. The question of location and dimensions of piers, slips, elevator and other facilities having been decided on, the important matter of ample trackage facilities was gone into very fully and a proposed layout of the terminal trackage submitted to all the railroads for approval. As already stated, we have, at the present time, fifteen miles of track constructed, which includes break-up and classification yards, besides tracks to all terminal facilities, and actual performance in extensive terminal operation has fully demonstrated the wisdom of the provision of ample terminal trackage.

At this terminal we are handling large quantities of bulk commodities such as wheat, lumber, sulphur, vegetable oils, molasses and coal, and other commodities like flour, apples, prunes and general cargo of an export and import nature. Last year we got off fairly well with the fifteen miles of trackage then in use, but at this time, with the enormous shipments of wheat, flour and lumber coming in, sometimes with as many cars as 300 on the tracks at one time, we are getting pretty well crowded, and we are asking the railroads to ease up on us a little, as this number of cars interfere with our switching operations, and this in spite of the fact that we have our own switch engine and the Union Pacific also operates an engine on the terminal most of the time to assist us in these operations. The commission, by maintaining its own switching engine, is, therefore, enabled to furnish service to vessels wishing to load or discharge cargo at night as well as in daytime.

The advantages of our self-contained combined rail-and-water terminal are the breaking up yard with its long switching track on which a large number of cars can be placed for classification and distribution to the terminal facilities and industries, thus insuring the quick movement of cars and the rapid removal and replacement of loaded and unloaded cars. With the handling, or rather unloading, of 100 to 125 cars per day, mostly wheat and flour, we are confronted with the necessity of enlarging the terminal trackage to take care of the additional tonnage which must be handled when the apple and prune shipments begin to come in in October, and for this purpose the commission has authorized the construction of three more miles of track.

I have inspected a great many of the ports of this country, and trackage facilities are, as a rule, inadequate at most of them. Back east they are doing something new which appears to be of considerable value. They are using caterpillar tractors for switching cars. These tractors handle three or four cars at one time, and in picking up cars these tactors cross the tracks at any convenient point, thus saving much time in getting around. We have been thinking of getting such a tractor for night switching for vessels, instead of maintaining an expensive switch engine for that purpose.

PACIFIC SHIPPING INCREASE

From every Pacific Coast port there comes the cheering word that the increase in passenger and freight services is presenting a constantly growing demand for greater pier space. The capacity of existing facilities is being crowded to the limit and harbor authorities are being forced by this demand into large programs for new construction and expansion of existing piers.

* An address delivered at the Tenth Annual Convention of the Pacific Coast Association of Port Authorities, Astoria, Oregon, Sept. 14, 1923.

HARBOR IMPROVEMENT NOTES

California Ports

The United States Army, Division of Rivers and Harbors, made recommendation to Congress for the following appropriations for improvements for the fiscal year 1925:

San Francisco harbor	$ 150,000
Oakland harbor	245,000
Richmond harbor	125,000
San Pablo Bay and Mare Island Strait	130,000
Suisun Bay channel	13,000
Petaluma Creek	37,000
San Rafael Creek	30,000
San Joaquin River	26,000
Stockton and Mormon channels	5,000
Sacramento River	5,000
Control of floods, removal of debris and improvement of Sacramento River	1,090,000

Oakland.—The appropriation for Oakland harbor will include cost of continuation of dredging of the channel to the harbor 800 feet wide and 30 feet deep. The harbor board reports the completion of the job of filling in the old West Oakland marsh and work of improving this property will shortly be undertaken. The new municipal pier at the foot of Castro street has also been completed and will shortly be available for business. The harbor board has recommended the construction of two new wharves on the inner harbor, which together with the improvements to be made on the West Oakland frontage and the new Castro street dock will furnish ample facilities for the growing commerce of the port. The Santa Fe Railway has included as part of its improvement program for this year the addition of trackage along the inner harbor, the purchase of a new car barge to cost $200,000, and enlargement of storage facilities.

Berkeley.—The work of construction of the first pier on the Berkeley waterfront was started during December at the foot of Ashby avenue by the Berkeley Waterfront Company. This company owns 2000 acres of tidelands, which it is planning to develop as an industrial center.

Richmond.—A new ferry slip has been contracted for by the Richmond-San Rafael Ferry Company to be built at Castro Point, Richmond, by Hannah Brothers, San Francisco contractors. The cost of the work will approximate $140,000.

San Francisco.—Preliminary steps in the harbor construction program for San Francisco, which includes the erection of three piers in the China Basin, were taken with the recommendation of the harbor board that $2,000,000 of bonds be sold, the money to be used for this work. The harbor board is also constructing a subway under Market street at the Embarcadero to relieve congestion of vehicular traffic along the waterfront. The contract was awarded to the Tibbitts Pacific Company on a bid of $238,700. The big Panama Canal dredge Culebra will start work early in March of dredging the bar outside of the Golden Gate. A channel 5000 feet wide and 40 feet deep will be dredged. A company of San Francisco grain merchants was recently organized for the purpose of operating a grain cleaning and handling plant at Islais Creek, the name of the new firm being the Islais Creek Terminal.

The Golden Gate, one of San Francisco's famous diesel-electric ferries

Sacramento.—The city of Sacramento will shortly have a new municipal wharf to take care of the ever increasing water shipments. The new wharf now under construction will cost $200,000. The tonnage handled over the docks at Sacramento during 1923 was 1,006,382.

Los Angeles.—The heavy shipments of petroleum from Los Angeles harbor seem to be constantly on the increase. The shipments for the first week of February totaled 2,184,896 barrels. The report of the harbor traffic manager shows a great increase of business handled through the harbor during 1923. The tonnage handled over the municipal wharves amounted to 22,469,917 tons in 1923, while in 1922 only 7,606,615 tons were handled. The new pier on Mormon Island, Wilmington, has been completed and assigned for use to various steamship lines. It is 1250 feet long with double high line tracks and able to accommodate three ships at one time. The cotton shipping industry promises to furnish Los Angeles harbor with an additional product for export and this is evidenced by the fact that 93,000 bales were shipped to the compressor now located at the port and the Austin Company of California is erecting a large steel warehouse and a compressor for next year's shipments.

San Diego will be able to offer to steamship operators increased docking facilities early in 1925, when the city expects to complete a $1,000,000 municipal pier now under construction. The pier will be 1000 feet long and 400 feet wide and will dock five vessels of 33 feet draft at one time.

That in the not far distant future California will have a number of new ports bidding for deep-sea traffic is evidenced by the interest being taken by the Department of Commerce and Army Engineers and the plans for dredging and development outlined for some of the smaller ports along this coast. Among the recommendations to Congress for appropriations for the fiscal year 1925 is a request for $881,000 for Humboldt harbor and $100,000 for Crescent City harbor. Newport Beach will be surveyed by order of the Department of Commerce with a view to ascertaining the possibilities of the harbor as an outlet for the products of Orange county, which are now exported through Los Angeles harbor. The Orange County Lumber Company, Inc., will erect a factory and docks on a 32-acre channel tract.

Long Beach has approved plans for harbor improvement which will open its port to ocean-going vessels. The plans include dredging of the harbor and construction of a series of wharves, also opening and deepening of the channel connecting Long Beach harbor and Los Angeles harbor.

Monterey Bay will also make a bid in the near future for ocean-going vessels and is now planning the erection of a steel and concrete combined breakwater and wharf.

Honolulu

Steam shipping arriving at the port of Honolulu during the year 1923 aggregated 5,213,057 tons in a total of 662 steamers. Sailing ships arriving during last year amounted to 45,511 tons in 18 vessels. A much greater tonnage is expected for 1924, and considerable harbor improvement is being planned and executed to take care of the ever increasing freight and tourist trade.

Oregon Ports

The business of all Oregonian ports continues brisk with the opening of 1923, lumber shipments to Japan combined with the ordinary lumber trade bringing large fleets of vessels to these ports. The Army Engineers have forces at work at practically all the harbors of Oregon dredging and building breakwaters to accommodate vessels of larger size and draft.

Portland.—The Port of Portland is receiving its share of the commerce of the Northwest, lumber being the chief product of export. The general cargo figures for 1923 show a tonnage of 2,005,650 incoming from domestic and foreign ports and a tonnage of 1,966,097 outgoing to domestic and foreign ports. During the month of January the port reports the high water mark for lumber shipments for all time, which reached a figure of 55,470,390 feet. One of the prime necessities of the port, according to lumber men, is a large terminal for the exclusive use of the steadily increasing volume of lumber cut by interior mills which will be exported through the Port of Portland.

The refrigeration facilities for handling apples and other fruits are now in operation on Terminal No. 4 with a capacity sufficient for 150,000 boxes of apples. A tariff of 6 cents a box the first month and 4 cents for the following months is charged for fruit refrigeration. Every effort is being made by the port commission to restrict the use of the refrigeration warehouse to in-transit shipments, as long-time storage would cause congestion and defeat the purpose for which the plant was built.

A general demand is being made by business men interested in the waterfront facilities for the Port of Portland that a preliminary survey be made of the possibilities and available areas for port development in order that plans may be dismussed and decided upon for future action. A plan which has received much favorable consideration from the citizens and which will be surveyed is what is known as the Laurgaard idea. The Laurgaard waterfront development plan includes the dredging of the Willamette River and the construction of a sea wall along the harbor line at Front street between Jefferson and Glisan streets and the erection of steamer and railway terminals on the waterfront and the construction of a new public market in this district and other improvements. The estimated cost of the initial project includes $50,000 for work of survey; $1,550,000 for the sea wall; $150,000 for fill between the sea wall and Front street; and $325,000 for intercepting sewer.

Astoria hopes to increase shipments from the Orient through the installation of a fumigating plant capable of processing foreign cotton and other fibers as is required by law before they may be distributed in the United States. The plant is being erected at the Port of Astoria terminals by Harry H. Leckenby of Seattle. Since the establishment of the port terminals the foreign and domestic trade of Astoria has shown a substantial growth. The principal exports are lumber, lumber products, canned salmon, flour and wheat.

The work of building the jetties at Coos Bay is progressing without interruption, but it will be many months before they are completed. In the meantime the Army Engineers will dredge a channel from the mouth of the bay to Millington to a depth of 22 feet to enable vessels of 8800 tons to take out full cargoes of lumber. The dredging of the channel will be completed by January 1, 1925, it is expected.

The Army Engineers also have dredges working at Tillomook Bay and Willapa Harbor, dredging these channels to a depth of 24 feet.

Washington Ports

Seattle.—The year 1923 stands out in Seattle's history as the high-water mark of waterborne commerce, the total cargo movement having reached a total of 6,273,606 tons, and plans are being made by the harbor board for a greater volume of business in 1924.

For every important port improvement projects will be started at Seattle during the present year in addition to improvements of existing facilities planned by the harbor board.

The Port of Seattle Commission purchased from the Shipping Board the site of the Skinner & Eddy Shipyard No. 2 for $600,000 and plans new terminals which will be the center of a new industrial center in the southern part of the city. The site contains 20.13 acres of land and a harbor area of 6.13 acres; it faces Elliott Bay. Just what plans will be made for this terminal have not been decided. The harbor board is planning a bond issue of $600,000 which will clear the indebtedness to the Shipping Board and make the funds voted by the city for this site available for the work of building the terminal.

Another great improvement for the port of Seattle will be the new terminal to be constructed by the Pacific Steamship Company for the Admiral Line and Robert Dollar interests. The site of the Skinner & Eddy plant No. 1 has been purchased for this terminal. It is located on Elliott Bay, extending from Massachusetts street to Connecticut street, and contains 25½ acres. According to plans given out by the architect and engineer, Henry Bittman, a pier will be built 1000 feet long and 160 feet wide. Two-thirds of the dock building will be on solid ground with a cement deck and will be capable of accommodating the largest vessels entering the port. Steel has been ordered for the first unit and construction will start in the late summer or early fall. The cost of the terminal is estimated between three and four million dollars.

(Section continued on page 196)

Aeroplane view of passenger liner steaming down the San Francisco waterfront

PACIFIC COAST manager of the Transmarine Corporation's intercoastal freight service, **W. D. Benson,** announces the transfer of his Pacific Coast headquarters from Seattle to San Francisco, following the original plan of the "T" Line when its coast-to-coast operations were inaugurated in June of last year. Commodious offices have been secured at 510-11-12 Robert Dollar building, 311 California street, which are also to be the headquarters of the New London Ship & Engine Company, another subsidiary of the Submarine Boat Corporation, of which S. **Burke Smith** is California manager. The moving of Mr. Benson's headquarters to San Francisco centralizes the Pacific Coast activities of the two companies. The Transmarine Line's schedule affords a weekly service with sailings every Tuesday from Port Newark (New York harbor) direct to Los Angeles, San Francisco, and Oakland, calling fortnightly at Portland, Seattle and Tacoma. Splendid terminal facilities, direct rail to ship connections, and open and protected storage are features of the service. The Transmarine Line now maintains its own offices at San Francisco, Los Angeles, and Seattle, enabling direct handling of its intercoastal business.

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W. H. Stewart, well known marine surveyor and consulting engineer, is now associated with the offices of **Edward S. Hough,** having joined the staff late in February. Mr. Hough, with headquarters at 16 California street, San Francisco, represents the Bureau Veritas, International Register, Walter Kidde & Company, and E. R. Hough, Ltd., London. Mr. Hough has a staff actively engaged as marine surveyors and consulting engineers. Mr. Stewart is widely known in all Pacific Coast shipping circles. For fifteen years he was surveyor for Lloyd's Register at San Francisco, and during the war he served with the United States Shipping Board. Since the war he has maintained offices as marine surveyor and consulting engineer.

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J. J. Walsh, assistant Pacific Coast manager of Furness, Withy & Company, is in receipt of advices from **T. A. Lee,** Pacific Coast manager, that on April 1 the Furness Line will open its own offices at Vancouver, Seattle, and Portland. The Pacific Coast headquarters are in the Balfour building at San Francisco. The establishment of the line's own offices in the North Pacific ports is in keeping with the firm's general policy of organization. Another interesting announcement by Furness, Withy & Company is that regular eastbound service from Los Angeles harbor to the United Kingdom and Eprope will be started by the Furness Line, beginning with the steamer London Merchant, about April 8. Monthly sailing from Los Angeles harbor are proposed, through the routing of alternate steamers via this port. The London Merchant, one of the fifteen-knot freighters of the Furness Line to this coast, will be the first of the fleet to call at Los Angeles on the eastward voyage since the Pacific Coast service was inaugurated. Westbound, however, the Furness carriers have called at Los Angeles alternately. The line plans to develop the movement of Southern California citrus fruits to the European markets through the refrigerator space on its vessels and also will seek general cargo.

✣

E. F. W. Alexanderson, consulting engineer of the General Electric Company and chief consulting engineer of the Radio Corporation of America, has been awarded the Order of the Polonia Restituta, by the Polish government, in recognition of his meritorious services in connection with the building of Poland's new radio station near Warsaw. This station is the first in Europe to make use of the Alexanderson high frequency alternator now used in all Radio Corporation stations for transoceanic communications. A similar station, now being built in Sweden, is expected to be ready for operation by midsummer.

✣

Ira G. Perin, who for several years has been the local distributor of the well-known Elwell-Parker line of electric stevedoring and warehouse trucks, has moved to new and larger offices at 200 Davis street, where he will be in the center of the shipping district, and, with increased facilities for service, will be in a better position to handle the business of the increasing number of steamship operators who are using Elwell-Parker electric trucks.

✣

Clarence R. Falk is now secretary and treasurer of The Falk Corporation, succeeding **E. A. Wurster,** who retired from that position on January 21. Mr. Wurster had been connected with the firm since its inception.

An interesting view showing the sidewise launching of the William K. Field, 12,000 deadweight ton bulk freighter for Great Lakes service built at the yard of the Toledo Shipbuilding Company, Toledo, Ohio; launched January 24, 1924

W. B. Keene, vice-president of the Emergency Fleet Corporation, announces that **James Sinclair**, who was head of the Far East and Long Voyage Trades Division in New York, has been transferred to the position of head of the European and Mediterranean Trades Division in New York, succeeding **A. G. Jackson, Jr.**, resigned.

✣•••✣

D. V. Stratton has been elected president of the New York Harbor Dry Dock Company, Inc., succeeding **George C. Clarke**, who resigned due to the pressing demands of his other business interests. Mr. Stratton has had wide experience in marine construction and repair work. Following a number of years of contact with general marine and dredging operations, he made a splendid record during the shipbuilding program incident to the war in organizing a number of steel-building yards for production. These various yards were among the leaders in quality of ships and speed in building.

✣•••✣

DEATHS.—Captain George Wallace Brown, retired whaler and well-known merchant marine master, passed away recently at his home in Edgarton, Massachusetts, according to word received by A. N. Hudson, chief engineer of the steamship La Placentia. Captain Brown was born seventy-three years ago in Fairhaven, the son of a shipbuilder. He took to the sea early in life, serving aboard square-rigger tradesmen. For many years he was aboard ships in Pacific routes. For eighteen seasons he was in the Orient run of the old Pacific Mail Steamship Company. Captain Brown retired in 1911 and since that time lived in Massachusetts.

Freight and Charter Report

February 15, 1924.

Since our last report, which was dated Dec. 18, there have been practically no new sales of lumber for Japan and such fixtures as we report were made to cover old sales and at freight rates that prevailed before the sharp drop about Dec. 1. There is no full cargo business in the market and space has been reported as fixed as low as $10 per M. Fixtures reported to cover old sales are as follows: Japanese stmr. Kohnan Maru, $15; Japanese stmr. Kaisho Maru, $15; British stmr. Elveric, $15; Japanese stmr. Wales Maru, Norwegian stmr. Edmund Munch, Norwegian stmr. Nordhav, Japanese stmr. Clyde Maru, Japanese stmr. Kofuku Maru, British stmr. Antonio, terms private; Hayo Maru, $56,000 lump sum; British stmr. Yarborough, $14.50; Japanese stmr. Yoko Maru and British stmr. Sunland, terms private.

Business in the direction of Australia still remains very quiet and the only fixtures reported are the British stmr. Queen Margaret for Adelaide by J. J. Moore & Co., terms private, and British stmr. Pennyworth, Feb. loading, by the American Trading Co. at a reported lump sum of $62,000.

Today one might say that the only demand that exists for tonnage for lumber is from the North Pacific to the Atlantic seaboard, the American stmr. Madison having been fixed for New York, terms private; American stmr. Golden Gate, Willapa Harbor to New York, at $13.50 per M.; American stmr. Nevadan, North Pacific to North of Hatteras, same rate; American stmr. Georgian, same business and same rate; also the American steamer Hawaiian for the same business at $14.50.

On time charter Danish stmr. Indien has been fixed for 12 months, trans-Pacific, at $1.55 per dwt per month; American stmr. Florence Olson, one round trip from this coast to Mexico at $300 per day, government form; American stmr. Frank Lynch for same business, terms private; Norwegian stmr. Luise Nielsen, one trip, Pacific Coast to Australia, by J. J. Moore & Co., terms private.

British tanker Strombus is fixed for crude oil, San Pedro to Hamburg, at 37 6 per ton. Tanker Miskianza, crude oil, San Pedro to north of Hatteras, terms private; British stmr. Scottish American, crude oil, San Pedro to Hamburg, 35 -; American tanker Agwi, Tampico to north of Hatteras, crude oil, 29c; another tanker for the same business at the same rate; tanker District of Columbia from this coast to Philadelphia, crude oil, 76c; Danish stmr. Marie Maersk, sugar from Cuba to Vancouver, $4 a ton; Norwegian sailing vessel Derwent, scrap iron from Peru to San Francisco, $4 per ton.

American barkentine Kate G. Pedersen fixed for coal from Newcastle, Australia, to Chile at a reported rate of 17 6.

The demand for space for wheat from the North Pacific to the United Kingdom or Continent is strong at 40 - for Feb.-Mar. The full cargo business in this commodity has also been very active and the following fixtures are reported: Spanish stmr. Arno Mendi, wheat, 37/6; British stmr. Gleniffer for Genoa, 38/-; British stmr. Beluchistan, Antwerp and or Rotterdam, 35/- one port, 36/- two ports; Norwegian stmr. Handicap, Antwerp or Rotterdam, 36/3; Spanish stmr. Ramon de Larrinaga, Genoa, terms private; British stmr. Trevithick, United Kingdom or Continent, 34 6; British stmr. Glentworth, Marseilles or Genoa, 42 3; British stmr. Benavon, United Kingdom or Continent, 40/-; Pilar de Larrinaga, Antwerp, 37/-; British stmr. Welsh City, Mediterranean, 42 6; British stmr. King Alfred, United Kingdom or Continent, 40 -; British stmr. Anglo Chilean, United Kingdom or Continent, 36/-; Italian stmr. Salina, Genoa, 40 6; Japanese stmr. San Francisco Maru, United Kingdom or Continent; British stmr. Elmpark, United Kingdom or Continent, 38 -; British stmr. Quebec City, Marseilles or Genoa, 38/-; British stmr. Vancouver, United Kingdom or Continent, 40 -; British stmr. Orient City, United Kingdom or Continent, 40 -; British stmr. Ocean Prince, United Kingdom or Continent, 37 6, option Mediterranean, 40 -; British stmr. Bengloe, Antwerp, 38 9; British stmr. Riol, United Kingdom, option Antwerp, 38 9; British stmr. King Bleddyn, United Kingdom, option Antwerp, 39 -; British stmr. Anglo Chilean, Antwerp; British stmr. Volumnia, Marseilles, 40 -; Japanese stmr. Erie Maru, United Kingdom, option Mediterranean, terms private; German stmr. Anna Kayser, United Kingdom or Continent, 40 -; Spanish stmr. Ardantza Mendi, San Francisco to the United Kingdom, barley, 41/3; British stmr. York City, London or Hull, barley, 42 6.

The demand for grain for Japan and China has died out entirely for the time being and such fixtures as we quote cover old sales: British stmr. Roman Prince, Shanghai, $6.50; British stmr. Inkum, Shanghai, terms private; Norwegian stmr. Tonjer, Dalny or Shanghai, $7; British stmr. Homer City, two ports Japan, $6.75; a "K" liner for Japan, $6.75, option Shanghai $7; Italian stmr. Anna, Shanghai, $6.25; Japanese stmr. Taibu Maru, Kobe and Dairen, terms private; British stmr. Monadnock, Hankow, $6.75; British stmr. Elveric, Shanghai, $6.12½; Danish stmr. Kina, Shanghai, $6.25.

PAGE BROTHERS, Brokers.

MARINE INSURANCE

THE MONTH'S DEVELOPMENTS ON THE PACIFIC COAST

By FRANCIS ADRION, Contributing Editor

ON Thursday afternoon, January 31, the Association of Marine Underwriters of San Francisco held their annual meeting. The following members were elected to office for the ensuing year:

President—G. L. West, of the Phoenix of Hartford.

Vice-President—H. L. Stoddard, of the Automobile Insurance Company.

Secretary and Treasurer—A. B. Knowles, of H. R. Mann & Company.

Executive Committee — L. J. Haefner, of the Fireman's Fund; F. C. Hutchinson, of the Queen staff; F. A. Jansen, of Parrott & Company.

Following its usual custom, the association held its annual banquet on the same evening. The committee in charge, wishing to introduce some novel feature to the evening's entertainment, arranged that the banquet be held on board the Panama Pacific liner Manchuria. This plan met with instant approval and resulted in a record attendance. when noses were counted, members and guests numbered over 70.

The speakers, representative of all branches of marine endeavor, took for their main topics the experiences peculiar to their professions. Captain Valentine J. Green, the new master of the Manchuria; Farnum P. Griffiths, admiralty attorney, and David C. Young, surveyor of the United States Salvage Association, Inc., all made very interesting talks along these lines.

The "Going down to the sea in ships" atmosphere was contributed to by all present under the able leadership of Leighton C. Robinson, deputy United States Shipping Commissioner, who held forth as "Chanty Leader." Captain Green was presented, during the course of the evening, with a memento of the occasion in the form of a handsome humidor.

The following were invited to attend the banquet as the honored guests of the association: Captain Valentine J. Green, master of the Manchuria; William Forsythe, chief engineer of the Manchuria; G. V. Richardson, chief officer of the Manchuria; K. H. Donavin, Pacific Coast operating manager of the Panama Pacific Line; Captain M. F. Tarpey, port captain of the Pacific Steamship Company; J. F. Clements, port engineer of the Pacific Steamship Company; David C. Young, surveyor United States Salvage Association; F. H. Evers, surveyor American Bureau; E. S. Hough, surveyor Bureau Veritas; J. S. Blackett, surveyor Lloyd's Register; Captain W. R. Kennedy, Lloyd's agent; Captain Cecil Brown, surveyor Board of Marine Underwriters; Captain J. W. Jory, surveyor Board of Marine Underwriters; J. Wadington, secretary Board of Marine Underwriters; James Quinby, chairman Marine Insurance Study Class; Captain Leighton C. Robinson, deputy United States Shipping Commissioner; and John A. Bishop of Johnson & Higgins.

The members and their guests attending the affair were: Andrew J. Lynch, W. J. Jansen, L. J. Haefner, Charles Seeley Jr., J. W. Dunbury, George Ismon, F. C. Hitchison, M. M. Levis, Ed L. Barry, Harry Pinkham, H. C. Ramsey, A. Seabury, C. B. Harrison, G. L. Rathbone, Edgar Lion, Wilfred Page, G. K. Smith, George W. Farnsworth, F. O. Baile, Wynn Jones, F. A. Jansen, George Jordan, A. B. Knowles, G. L. West, H. L. Stoddard, S. A. Livingstone, R. S. Cochrane, Edwin Sutehall, W. E. J. Ord, M. R. Wallace, Carroll Single, W. L. Dawes, William K. Shackelford, K. M. Davis, George Hansen, John A. Bishop, George Parrish, G. W. Cortelyou, H. W. Hauser, T. P. Kehoe, Farnum P. Griffiths, C.

J. Holman, R. L.Lutich, Harold Lee, H. R. Hammond, Al Cupid, Al Young, A. R. Bowhay, W. Schnur, William Menzies, G. B. Oxford, C. B. Sargent, and Larry Maye.

The splendid turnout on the part of association members as evidenced by the above list is of twofold interest at this particular time. First, as regards the success of the yearly get-together, which was worthy of the best traditions of the association; and secondly, because it gave the lie to the feeling that interest in the organization had waned to such an extent as to threaten its existence.

It cannot be said, however, of those who spoke of dissolving the association, that they really looked for or desired any such thing. Rather, it was their idea that to promulgate such a thought would bring forth a storm of protest, as indeed it did. Out of this they felt that a new era of growth and usefulness would engender the association, calculated to restore it to the admirable position in marine circles that it did and should hold.

In this connection it might be added that the success of an organization of this nature depends solely upon the support it receives from its members. If the work of carrying on is continually left to a faithful few, it is only natural that dry rot eventually sets in. It is the duty of every member to do his utmost to further the cause. When called upon to act on a committee, or otherwise, he should respond willingly, and not sidestep his obligation to the association.

As regards the yearly program of the organization, a committee, appointed by the president, is to consider ways and means of increasing the membership and otherwise improve the morale. The association is now thirty-nine years old and is firmly imbedded in the history of marine life on the street. Like the family orchard, it has been left too long to its own devices until there has come a time when it is necessary to either cut down the tree or do some pruning and fertilizing. Having decided that uprooting would be an unworthy end for our particular tree, we are now faced with the alternative. Let's go!

Wandering Accounts

It is said that competition is the life of trade, but it seems to me that this can be carried to extremes. If your competitor is operating on a hit or miss basis, without due regard for his costs and upkeep, aided by the ample pockets of a rich uncle (company), one is very apt to feel like applying for a license to carry a gun.

It is truly exasperating to underwrite an account for years on a very narrow margin of profit only to find that someone has offered broader coverage at 50 per cent lower rates.

Almost always, the original insurer has the option of retaining such an account. This fact alone should be food for thought for the do or die business man. On even terms the assured is naturally partial to the company that has served him fairly over a period of years, against some other unknown quantity.

The original underwriter also has a rich uncle. Should he decide to play ostrich and retain the account against some future day when perhaps an adjustment in rate can be effected, he may do so. In fact, if there is the barest chance of retaining the account without losing his shirt, he will, in all probability, do just that.

There is a limit to his uncle's indulgence, however, and he is now and again forced to lose business to his friend, the enemy. It is a very poor sort of consolation to know that the rate cutting company will pay through the nose for the their new acquisition.

This sort of situation apparently works to advantage of the assured. On the face of it he would seem to gain, regardless of which way the cat jumps. On the contrary, however, it is quite likely that in the long run he will find that the protection afforded him is in exact proportion to the equity of the insurance rates paid. It is needless to point out the ever recurring losses under a contract which are technically not a claim. Losses which are paid more or less cheerfully according to the worth of the contract involved. It is a self-evident fact that the thickness of a loss man's glasses are dependent to a great extent on whether an account is paying its way.

Furthermore, this fact is particularly, and I might add peculiarly, true of marine insurance. The elements of trust, confidence and good intention are necessitated by the very nature of the business. The thousand and one unusual contingencies which crop up continually make this so. The man who ignores all this and assumes a hidebound attitude, depending solely on the contract in his safe, is riding for a fall.

Coast Surveyor's Confab

The surveyors to the Board of Marine Underwriters of San Francisco located in the principal coast ports met in San Francisco on February 13 as guests of that body. This is the first time the surveyors have been brought together in this manner and the meeting promises to be an annual event hereafter.

The board itself, thanks to its splendid personnel, had a very successful year in 1923. An annual meeting of the Board Surveyors, permitting an exchange of ideas, should add greatly to the present

valuable service rendered by the board. In fact, the many radical changes of recent vintage in coastal conditions, both as regards increased tonnage and type of vessels employed, necessitate a pooling of the individual findings of the various surveyors.

Local marine underwriters, in addition to the indirect benefits naturally resulting from the above, are enabled to lay their particular problems before this broup of experienced men and secure a closeup of coastal ports and conditions such as could hardly be obtained at long range.

In addition to Captain Cecil W. Brown and Captain J. W. Jory, who are located in San Francisco, the board's guests were: Captain S. B. Gibbs of Seattle, Captain W. C. McNaught of Portland, Captain S. Cullington of Vancouver, and Andrew Young of San Pedro.

Developments of the Month on the Atlantic Coast

CHARLES F. HOWELL, Contributing Editor

UNDERWRITERS feel they have a grievance against the brokers, that has long escaped ventilation in public prints but which stands in need of immediate adjustment. It concerns the way in which uniformity in forms is applied to the wording of extensions of masters' notes of protest. Some of the larger brokerage houses employ an almost identical style for these important records of evidence, and it is insisted that the forms so used frequently take good care of the brokers' shipowner-friends but diminish the grounds for recovery that belong to the shippers.

Masters Protest

The masters' required procedure is well known. Upon arrival at the first port after the occurrence of any casualty or unusual circumstance, the master of a vessel, in order to establish the cause of any damage to ship or cargo, must appear before a notary public, consul or other qualified person and file a note of protest. Thus he preserves his right to later extend the protest; and in that extension he describes at length the nature of the occurrences that made the protest necessary.

The purpose of the protest is to establish facts concerning the actual happenings on a voyage, so that the cause of losses to ship or cargo may be accurately known and the reasons properly recorded. If any loss or damage be the consequence of perils of the sea, or other perils beyond the power of the master to avert, the protest serves to relieve the ship from liability and, at the same time, establish to the satisfaction of marine underwriters the cause of such loss, accident or damage. By this evidence the latter may be guided, in claim adjustments, by the facts of the case as had at first hand.

Extension of Protest

A practice has arisen by which masters appear before some qualified person in the adjusting department of insurance brokerage offices in order to make the extension of the note of protest. It has also become a practice among insurance brokerage offices to use carefully prepared forms for the purpose of "aiding" the master in his description of the occurrences of the voyage. But this form-description is often found to be of such a nature as to relieve the shipowner from liability that is properly his, and to deny to the shipper a legitimate claim against the carrier.

Shippers' Claim

Later on, when the shipper lodges his claim with the carrier, he is advised by the latter that he is not responsible for such damages, and the extension of the protest, with its favorable phraseology, is cited in support of the contention. Thereupon, the shipper turns to his underwrites to make good the loss. If the occurrence be of such a nature that it may be established as falling within the terms of the insurance, but only if certain facts can he shown and these depend upon the extension of the protest, the situation becomes one to be greatly regretted. The underwriter may refuse to recognize as authoritative the statements made in the protest; his position being that all protests noted in certain insurance brokerage offices are almost identical and that little faith, in consequence, is to be placed in them.

The adjuster will argue, to the contrary, that because masters are usually possessed of inferior descriptive powers, or knowledge of what facts should be brought out, it is necessary to assist them. But this contention is open to question, as any man can describe an accident in his own way more accurately, undoubtedly, than it appears in the far-reaching and comprehensive terms found in protests drawn up in insuranec brokerage offices. Furthermore, the underwriters would be inclined to place absolute confidence in the master's own account of what happened. It is therefore insisted by underwriters that the very best way to defeat the purpose of protests is to continue the practice of drawing them in insurance brokerage offices.

Mexican Developments

A considerable stir was created among underwriters by the recent

news that two tankers had been fired upon while running the blockade instituted by the rebel forces at Tampico. War rates to ports in that vicinity were promptly readjusted. It is reported that the de la Huerta faction plans to mine the harbors of Frontera, Puerto Mexico and Vera Cruz, but that they will postpone immediate action in conformity with the request of the United States.

Rates in the New York market have been many and varied, owing to the suddenness of the development and the uncertainty of information. But the prevailing opinion appears to be that 2 per cent to the port and 4 per cent to points in the interior are adequate to cover present exigencies. Underwriters are excluding the risk of conflagration, but as it seems both Federals and rebels are anxious to avoid trouble with foreign powers, the danger of seizure and appropriation of goods is not regarded as important.

Lake Grain for Shipment

When navigation on the Great Lakes reopens it is already clear that a heavy shipment of grain may be expected. There is a very considerable amount of it in store, all ready for early carriage, at the upper ports. By the middle of January stocks at Fort William and Port Arthur stood at 50,822,087 bushels. At the same time the Duluth elevators and those at Superior had more than 15,000,000 bushels in store and the elevators at Chicago and South Chicago were holding about 25,000,000 bushels. This made a total of more than 90,000,000 bushels at the leading ports. Stocks at the Canadian head of the Lakes are considerably heavier than they were a year ago.

Rubber Rates Slashed

Once more the rates on rubber from the Far East have been cut by hungry underwriters. These gentlemen seem to lose sight of the value of a risk just as soon as an account is threatened. The high labor charges involved in reconditioning damaged rubber make a particular average loss of a much higher percentage than is ordinarily anticipated in connection with the insurance of commodities which carry as low rates as does rubber. Again, general average disasters in connection with long voyages are apt to be more numerous and serious than in the shorter voyages. But these important considerations too often go by the board when pressing demand is for premium volume.

Canadians Oppose Coaling Restrictions

Discussion of the attitude of the Canadian government toward marine insurance companies of England still continues, and it is expected that action on the part of the Dominion is likely as soon as spring is here. The real crux of the controversy lies in the fact that Canada has a fleet of steamers owned and operated by the government, and that there is undoubtedly a discrimination against practically all Canadian ports in the B. N. A. clause of the British marine contract. Under this clause there is a waranty that ships will not enter or sail from any port or ports, place or places in British North America on the Atlantic Coast excepting Halifax, Louisburg and Sydney for coaling purposes, and not north of 50 degrees north latitude on the Pacific. This applies on hulls and cargoes outward on both Atlantic and Pacific, and the Canadians protest that they are obliged to pay large sums in extra premiums because of the use of the clause. They object to English underwriters placing, as they describe it, "a premium" on doing business with Canada. Demand is made by the Canadian Department of Marine that the B. N. A. clause be entirely eliminated, and they will not rest content with mere concessions. As was noted by us in

last month's issue, English underwriters are making light of the threatening attitude of Canada and point to their loss experience on the St. Lawrence in winter months, as caused by ice and fogs, and brand Canada's revolt as ill-timed. Just the same, it is highly probable either that a Canadian Lloyd's will be organized to give the kind of insurance desired by our northern neighbors, or else that the Dominion government will soon begin the business of insuring vessels.

Cargo Ownership Changes

Much trouble and possibly heavy losses can be saved the assured if care is taken, in the beginning, in stating who is insured, the interest, and to whom the loss is payable. Goods are carried for a trip only, and the ownership may change one or more times during a voyage; it is, therefore, desirable that the insurance should be capable of transfer to anyone to whom the insured properly transfers his interest in the property. The general rule of assignment is that a marine policy is assignable unless it contains clauses expressly prohibiting assignment. It may be assigned either before or after loss, but where the assured has parted with or lost his interest in the subject matter, and has not, before or at the time of so doing, expressly or impliedly, assigned this insurance, any later assignment is inoperative.

In this country the usual documents covering cargoes are insurance certificates, rather than a policy of insurance. They are issued by shippers who hold a policy which covers shipments which they may make and in which they are interested or have orders to insure. These certificates are attached to the negotiable bills of lading, and the holder of these is entitled to receive payment of loss. In modern commerce, banks are frequently the parties having the insurable interest, as they have advanced the funds against the documents. If it is not desired to have certificates negotiable, they can be made payable to a particular person.

Syndicates Write Disbursements

About the middle of January the American Marine Insurance Syndicates began the writing of disbursements insurance. This coverage fits in acceptably with hull insurance, and there has been for some time a very general feeling among the subscribers to the Syndicates that they should participate in this class of business. An amendment to this effect was made to the Articles of Agreement at a meeting last November, and in conformity therewith the subscribers to Syndicate "C" have begun covering disbursements and or other total loss interests. It is possible that Syndicate "B" will write this class later on. The limit remains, as before, $2,500,000 upon a single hull and/or disbursements.

Liability of Broker

An interesting case in which brokers were held liable for the premium was recently decided before a judge and jury in the Appellate Division, First Department, New York. Action was brought by Finn, Sandberg, Raynes & Lee, Inc., insurance brokers of New York, against Douglas, Rogers & Company, Ltd., insurance brokers of Alberta, Canada, to compel the latter to pay to the former premiums which had been advanced upon insurance policies written for the account of the Wedgeport Beam Trawler Company. The New York brokers claimed that the Canadian brokers, by their president, James R. Douglas, requested the placing of certain insurance upon the fishing trawler Bernard M., which insurance the New York brokers placed and paid the premium to the insurance companies, billing the Canadian brokers for these premiums, less one-half the commissions as agreed upon by Mr. Douglas. The Canadian brokers refused to pay the account and insisted that, inasmuch as they had given the New York brokers the name of the insured and the name of the vessel, they could not be held liable because, being themselves brokers, they had disclosed their principal and the New York brokers must look to the insured for the premiums upon the policies.

The defendants called attention to the general custom in London, in which market most of this insurance was placed, that the insurance companies look to the broker placing the risk and that broker, in turn, to the insured, and that the intermediate broker is in no way responsible.

The jury returned a verdict for the full amount for the New York brokers.

News in Eastern Offices

The Insurance Company of North America and its affiliated companies have opened a branch office at 513 Keyser building, Baltimore, for the exclusive handling of their marine and inland marine lines. E. M. Cheston is in charge.

Stewart T. Dunlap has been appointed assistant marine manager of the American Foreign Insurance Association. He has been three years with the association.

All the talk of the street is of the reported approaching merger of the two great brokerage houses of Johnson & Higgins and Willcox, Peck & Hughes. No definite information can be had at either headquarters, but there is believed to be good reason for anticipating this move in the near future. These firms duplicate each other's fields and are maintaining heavy overhead expenses that might be readily cut in two by the simple device of an amalgamation. Both firms have sent representatives to London to try and arrange for the single repesentation of these houses on that side.

SHIPBUILDING IN 1923

THE shipyards of the world during 1923 launched less than half as much tonnage of merchant vessels as they did in the last pre-war year, 1913, according to a statement issued by Lloyd's Register of Shipping, covering returns from all maritime countries for 1923. Compared with launchings for 1913, aggregating 3,332,000 gross tons, it is pointed out, last year's total was only 1,643,000 tons.

Last year's figures show a sharp decline from those of the previous year, and, with the exception of 1915, are the lowest on record since 1909. Excluding these two years, the 1923 total is lower than for any year since 1897. It should be noted, however, that the returns showing tonnage under construction at the beginning of this year showed some increase over the quarter ending September 30, last.

The falling off in construction work last year was general, the only country for which an increase is reported being the United States, where about 53,000 gross tons more were launched than in 1922. This, however, compares with a decrease of about 385,000 tons for Great Britain and Ireland and of almost half a million tons for all the other shipbuilding countries combined. Lloyd's Register gives the following table, showing the total of launchings for the two years, in gross tons:

	1923	1922
United States	172,817	119,138
Great Britain and Ireland	645,651	1,031,081
Other countries	824,713	1,316,865
World total	1,643,181	2,467,084

The increase in the American output last year marks the first break in a continuous period of decline since 1919.

Last year's decline in tonnage launched, which was less than half the total decline for the previous year, shows the first slackening in the proportion of shrinkage since 1920. In that year launchings were 18 per cent less than in 1919; in 1921 they were 26 per cent less than in 1920; and 1922's total was 43 per cent less than 1921's. For 1923, however, the launchings were 33 per cent less than in the previous year, the first break in the progressive decline.

There was also a sharp drop last year in the number of large vessels launched, those over 10,000 gross tons aggregating only 8, as compared with 27 in 1922 and 47 in 1921.

An increase was shown in 1923, however, in the construction of motorships, the world launchings of vessels equipped with internal combustion engines totaling 226,000 gross tons, as compared with 209,000 tons in 1922.

IN PACIFIC COAST SHIPYARDS

SHIP REPAIRING
SHIP BUILDING
RECONDITIONING
ENGINE REPAIRS

REORGANIZATION AT MOORE'S

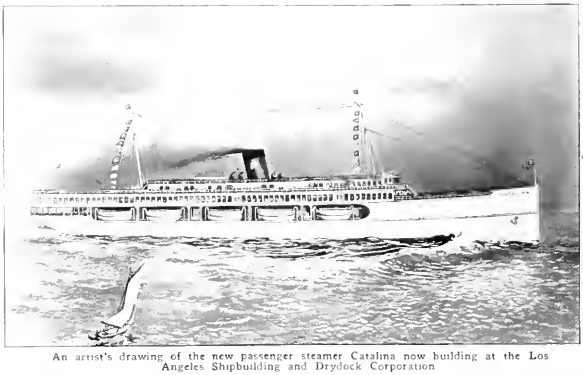
As we are going to press, word comes that articles of incorporation have been filed for the firm of Jos. A. Moore, Inc. This firm has taken over by purchase the assets, name, goodwill, and business of the Moore Dry Dock Co., formerly the Moore Shipbuilding Co. Jos. A. Moore has been the active manager of the Moore Dry Dock Co. and of the Moore Shipbuilding Co. for the past five years. He has now acquired by purchase the interests of his brother R. S. Moore, who is retiring from active business. Associated with Jos. A. Moore as directors are J. B. McCargar, vice-president, Crocker National Bank; R. S. Shainwald, general manager, The Paraffine Companies, Inc.; W. S. Duzan, vice-president, Pacific Securities Company, and I. S. Lillie, attorney.

New Catalina Steamer

AT the Los Angeles Shipbuilding & Dry Dock Company yard, work is progressing nicely on the Catalina, the new passenger steamer for William Wrigley, Jr. The contract for the building and equipment of this vessel was obtained by the Los Angeles Shipbuilding & Dry Dock Company in active competition with the shipyards of America, both as to price and design. The artist's sketch reproduced herewith will give some idea of the trim lines of the design.

The Catalina will cost $1,000,000 and will be delivered by July 1, next, in time to join the fleet of the Wilmington Transportation Company in carrying the heavy travel predicted by that company this coming summer to Catalina Island.

With a length over all of 300 feet and a 50-foot beam, the Catalina will be engined with two sets of triple expansion engines developing about 4000 horsepower. Steam will be furnished by a battery of water-tube boilers working at 225 pounds. The vessel will burn oil fuel and will be equipped with auxiliary machinery to fill all the functions required.



An artist's drawing of the new passenger steamer Catalina now building at the Los Angeles Shipbuilding and Drydock Corporation

IN PACIFIC COAST SHIPYARDS

SHIP REPAIRING
SHIP BUILDING
RECONDITIONING
ENGINE REPAIRS

The vessel will be electrically lighted throughout and will have a cruising speed of 17 knots.

A noteworthy feature included by L. E. Caverly, chief engineer of the shipbuilding company, who designed the vessel, is the life-saving equipment. There are twenty Lundin patent life boats, each having a capacity of 76 persons. These boats are to be slung from the main deck rather than the upper deck, as is the general custom. This method will guarantee prompt and safe launching should the occasion demand.

Recent Contracts

Bethlehem Shipbuilding Corporation, Sparrows Point Plant, two barges for the Hudson River Day Line, 100 by 18 by 16 feet.

Dravo Contracting Co., Pittsburgh, steel workboat for Second Pool Coal Co., 40 gross tons.

Nashville Bridge Co., Nashville, Tenn., two dock barges for U. S. Engineers, Louisville, 120 by 36 by $7\frac{1}{2}$ feet.

Keel-layings

Oil barge for Seaboard Shipping Co., Federal Shipbuilding Co., Jan. 29.

Two steel tugs, Great Lakes Dredge & Dock Co., Chicago, Manitowac Shipbuilding Corp., Manitowoc, Wis., Jan. 12 and 19.

Oil barge, Sun Oil Co., Sun Shipbuilding Co., Chester, Penn., Jan. 16; oil barge, N. Y. Central R. R. Co., Jan. 18; oil barge, Tidewater Oil Co., Feb. 1.

Tacoma, steel hull, Cincinnati Pomeroy & Charleston Packet Co. The Chas. Ward Engineering Works, Charleston, W. Va., Jan. 17.

Launchings

Deck barge, Cumberland Transp. Co., Nashville Bridge Co., Jan. 23.

Tugs A and B, U. S. Engineers, Spedden Shipbuilding Co., Baltimore, Jan. 11 and 28.

William K. Field, bulk freighter, The Reiss S. S. Co., The Toledo Shipbuilding Co., Jan. 24.

Deliveries

Submarine S-41, U. S. Navy, Bethlehem Shipbuilding Corp., Union Plant, San Francisco, Jan. 15.

Light vessel 110, Dept. of Commerce, Bath Iron Works, Jan. 14.

Submarine S-47, U. S. Navy, Bethlehem Shipbuilding Corp., Fore River Plant, Jan. 15.

Repairs

COLLINGWOOD SHIPBUILDING CO., COLLINGWOOD, ONT.

Bottom damage repairs: steamers Glencassie, Glenburnie, Canadian (also general machinery repairs), Brookton (also new blades and general machinery repairs). Machinery overhaul and new tail shaft liner: Canadian Trader. Temporary bottom repairs: Glenstriven.

MOORE DRY DOCK COMPANY, OAKLAND, CALIF.

Drydock, clean, paint, hull repairs: W. P. barge No. 3; two launches Oakland Launch Co. Drydock, clean, paint, hull, deck, engine: Annette Rolph, San Pablo, Crescent City, Hagen, U. S. A. T. Somme, El Lobo, Horace X. Baxter, schr. Golden Gate (only propeller repairs), Pyramid. Drydock, new propeller: tug Crolona. Drydock, misc. hull: Westport. Drydock, misc.: Necanicum. Drydock, rudder repairs: Columbia. Hull: President Cleveland, schr. Intrepid, m.s. Mount Baker (also engine and winch), stmr. Brookings (also engine and tailshaft), President Taft, City of Sydney, Standard Arrow (also engine and boiler). Engine and boiler: Commercial Pathfinder. Engine repairs: West Cahokia. Engine and windlass: Santa Barbara. Boiler repairs: City of Seattle. Anchor windlass repairs: President Hayes.

NAVY YARD, PUGET SOUND

Docking and misc.: Tennessee, Milwaukee. Misc.: Pennsylvania, Nitro, Cincinnati, Kennedy, Moody. Docking and hull: Zeilin. Misc. repairs incidental to operation as district craft: Mahopec, Swallow, Tatnuck, Iroquois, Pawtucket.

TODD DRY DOCKS, INC., SEATTLE, WASH.

Dock, clean, paint, misc.: West Gambo, Ramus, President Jefferson. General reconditioning: Moonlite, Emma Alexander, Sioux. Retubing boilers: H. F. Alexander. Furnish oil burning parts: Nabesna. Extensive engine room repairs: Admiral Rogers. Drawing stern frame: Seattle. New stern frame: Margaret Dollar. Dock, clean, paint: Bearport, Eknaren, Faxen, Willsolo. Repair cargo port: F. J. Luckenbach. Make hatch covers: Edgar Luckenbach. Furnish oil heaters: President Madison, President McKinley. Misc.: Lena Luckenbach, Colusa, Norfolk Maru, Baluchistan, Sumngentco, Yoken Maru, City of Bremerton, Toyooka Maru.

UNION SHIPBUILDING CO., BALTIMORE, MD.

Bottom damage: Schenectady, Ormes, dredges Arundel, National, International. Clean and paint: Anacortes, Packet, Alabama, West Lake, J. W. Moore, Nancy Weems, barge Engine Hooper. Tail shaft and bearing: Winston-Salem, Dallas.

YARROWS, LTD., VICTORIA, B. C.

Repair steering gear: Hallgrim, Shinkai Maru (also engine). Dock, clean, paint, misc. engine room: Princess Alice, Princess Beatrice. General extensive overhaul: Lompoc, Golden Gate. Dock, clean, paint, and survey: Tenbergen. Docked, surveyed, temporary repairs due to stranding: Yogen Maru. Dock, clean, paint, change propeller blade: Princess Victoria. Dock, clean, paint: Ardenza, Princess Louise. Dynamo and steam pipe repairs: Mongolian Prince. Boiler: Grainer. Dock, propeller change: Matsqui. Dock, engine room and shaft: Teco. Extensive overhaul: Mina Brea. Engine repairs: Monterey, Unita, Ida (also deck). Misc.: Antar, Augvald, Author, Bakersfield, cableship Restorer, Princess Mary, Golden Gate.

New Construction

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT
Potrero Works

Purchasing Agent: O. W. Sweett, Salem (Mass.) USN.
S-41, hull 146, delivered Jan16 24
Hull 5319, steel barge, 56ft 10in [illegible] P. 26 molded beam, 14 in [illegible] Dec 26 24, launch March 24, est
Hull 5320, sister to above, keel Dec launch March 24, est

San Pedro Works

Shelling, hull 5315, steel [illegible] Pacific Coast Co., 115 m.l. [illegible] 37 m.l. [illegible] to depth, keel Nov17 23, launched Feb6 24, delivered Feb9 24.

HANLON DRYDOCK & SHIPBUILDING COMPANY
Oakland, Calif.

Purchasing Agent: R. B. [illegible]
Dan F. Hanlon, hull 51, [illegible] D. I

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
San Pedro, Calif.

[illegible]
Mar1 24, est

NAVY YARD
Puget Sound

[illegible]

JAS. ROBERTSON SHIPYARD
Alameda, Calif.

Ferryboat, double end, side wheel; Richmond-San Rafael Ferry Co.; 172 LBP; 57 beam; 9 loaded draft; 12 knots speed; 2 750 IHP; 2 compounds; 2 stb back boilers; keel Dec 10; launch Apr21 24, est; deliver May20 24, est.

W. F. STONE & SON SHIPBUILDING COMPANY
Oakland, Calif.

Ohio, hull 31, yacht; for I. V. Hyde; 80 LBP; 14 beam; 6 loaded draft; deliver June1 24, est.

PRINCE RUPERT DRY DOCK & SHIPYARD
Prince Rupert, B. C.

Lighter, hull 60ft, for Dominion government; Fisheries Service; deliver Mar30 24, est.

TODD DRYDOCK & CONSTRUCTION CORPORATION
Tacoma, Wash.

Six steel barges, U. S. Engineers, Portland, 120x34x7'6 feet; launch Mar 24, est; deliver Apr 24, est.

No name, hull 43, passenger and freight str; Southern Pacific Co.; 448 LOA; 52 beam; 25 loaded draft; 16 knots speed; 7000 DWT; keel Feb20 24, est.

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. A. V. Millar.

Forty coal barges, Carnegie Steel Co.; 175 long by 26x11, 25 delivered.

Five coal barges, West Kentucky Coal Co.; 175x26x11, 8 delivered.

Twenty coal barges, Carnegie Steel Co.; 175x26x11, deliver spring 1924.

Nineteen barges, U. S. Engineers, Louisville, Ky.; 195x26x6'6, deliver July 24, est.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft; deliver 1924, est.

Sixteen barges, U. S. Engineers, Louisville; 110x26x6'6, deliver Oct1 24, est.

THE AMERICAN SHIPBUILDING COMPANY
Lorain, Ohio

W. H. Gerbracht, vice president and director of purchases.

Greater Detroit, hull 755, pebble stnr; Detroit & Cleveland Nav Co.; 440 LBP; 98 beam; 16 loaded draft; 20 mi loaded speed; 2 cyl comp, 22 - 42 - 70-48, 10,000 IHP; 6 SE and 3 DE Scotch boilers, 14x3x8; keel Feb20 24; launched Sept14 23; deliver spring 1924, est.

Greater Buffalo, hull 756, sister to above; keel May2 23; launched Oct27 23.

No name, hull 788, bulk freighter; Ford Motor Co.; 600 LBP; 62 beam; 20 loaded draft; 11 loaded speed; 12,000 DWT; 3300 IHP; Doxford diesel engs.

BATH IRON WORKS, LTD.
Bath, Maine

Purchasing Agent: I. L. P. Burke.

Light vessel 102, hull 57; second class light vessel; U. S. Dept of Commerce; 109'6 LBP; 30 beam; 14.4 loaded draft; 9½ speed; comp engs; 400 IHP; 2 Scotch boilers; 10'6x11'3; keel Sept 1 23; launched Dec 24, deliver Feb25 24, estimated.

Light vessel 110, hull 91, sister to above; keel Oct6 23; launched Nov10 23; delivered Jan14 24.

Light vessel 111, hull 92, sister to above; hull only; keel Aug24 23.

No. hull 96, yacht for Hugh J. Chisholm; 140 LBP; 18'6 beam; 9'6 loaded draft; 15 knots speed; two steel engs; total IHP; keel Dec1 23; launch May1 24, est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT
Quincy, Mass.

[illegible] 1200 ton Lighter Caisson, U. S. N. [illegible] 1400 battleship, U. S. N. [illegible]

[illegible] U. S. N. [illegible]

Jan18 24 [illegible] U. S. N. [illegible] delivered

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT
Wilmington, Del.

Hull [illegible] keel Sept 24 23.

Hull [illegible] keel Nov10 23.

Hull 346-9 [illegible]

BETHLEHEM SHIPBUILDING CORPORATION, SPARROWS POINT PLANT
Sparrows Point, Md.

Alexander Hamilton, hull 4217, passenger vessel, Hudson River Day Line; 328 LBP; 76 beam over guards, 13.8 depth; 1 TE eng, inclined, 3500 IHP; 2 single and 2 double ended boilers; keel Apr2 23; launched Oct20 23.

Boston, hull 4218, passenger vessel; Eastern Steamship Co.; 385 LBP; 72.6 beam, 23.9 molded depth; twin screw turbine engs, 6400 IHP; 6 Scotch boilers; keel Mar13 23; launched Oct27 23; deliver Nov15 24, est.

New York, hull 4219, sister to above; keel Apr3 23; launched Jan12 24; deliver May 15 24, est.

Hull 4222, oil barge; Standard Oil Co. (N. J.); 136 LOA; 23 molded beam; 5'6 depth.

Hull 4223, sister to above.

Hull 4224, sister to above.

Hull 4225, sister to above.

Hull 4226, sister to above.

Hull 4227, sister to above.

Hull 4228, barge, Hudson River Day Line; 100x38x8 ft.

Hull 4229, sister to above.

CLINTON SHIPBUILDING & REPAIR COMPANY
Philadelphia, Pa.

No name, hull 45, oil barge, Cia. of Phila.; 88 LBP; 20 beam; 8 loaded draft; keel June 24, est; launch July 24, est; deliver Aug 24, est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Wig Wag, hull 2744, D armed, U. S. Radio, 62x10'6, speed 30 mi, two 700 HP speed wag engs.

Hulls 3746-50, mg, stock, 34x8'6; hulls only, 5 delivered.

Oklahoma, hull 2752, tender, U. M. Wainwright class 36 engs.

Hulls 3755-56, 26-ft tenders for Cox & Stevens.

Hull 2757, runabout, Sidney A. Smith; 60 HP Speedway engs.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.
Philadelphia, Pa.

Purchasing Agent: Ed. A. Locke.

Ticonderoga, hull 501, scout cruiser, U. S. N.; keel Nov18 20; launched Aug26 23; 91.4 per cent comp; Feb1 24.

Marblehead, hull 502, scout cruiser, U. S. N.; keel Aug4 20; 76 per cent comp; Feb1 24; launch of Oct19 23.

Memphis, hull 503, scout cruiser, U. S. N.; keel Feb14 22; 66 per cent comp; Feb1 24.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

No name, hull 61, tug, builder's account; 98 LBP; 18 beam; 9 draft; 14 steel standard gas engines; keel Nov 22; launched Aug 24, est; deliver to Detroit Jan1 24, est.

Reomar III, hull 70, R. E. 0815, 100 LBP; 18'6 beam; 8'6 draft; 14 steel standard engs, 450 IHP; keel Sept1 23; launched Nov15 23; deliver June 1 24, est.

Two steel car floats, Erie R. R.; 186 long; 34 beam; 8'6 depth; launch April 24, est; deliver April 24, est.

DRAVO CONTRACTING COMPANY
Pittsburgh, Pa.

Hulls Nos. 267-272, inc, 6 steel barges, U. S. Engineers; 400 gross tons each.

Hulls Nos. 279-281, inc, 3 steel sand and gravel barges, builder's account; 135 gross tons.

Hulls 282-285, inc, 4 steel dump scows, builder's account.

Hulls 293-306, inc, 14 steel barges, Mississippi River Commission, Memphis; 400 gross tons each.

Hulls 307-308, inc, 2 steel sand gravel barge, builder's account; 135 gross tons.

Hulls 308-313, inc, 6 steel dump scow, U. S. Engineers, Louisville; 127 tons each.

Hull 317, derrick boat, U. S. Engineers, Huntington, W. Va.; 100 gross tons.

Hull 318, steel hull for sand dredge, Mississippi River Commission, Memphis; 28 gross tons.

Hulls 319-325, inc, 7 steel derrick boat hulls; 115 gross tons each; for U. S. Engineers, Louisville, Ky.

Hull 332, steel barge, U. S. Engineers, New Orleans; 150x27, 430 tons.

Hull 333, dredge, Ohio River Sand Co., Louisville, 155x32x5'6, 430 tons.

Hull 334, sand dredger, Keystone Sand & Supply Co., 155x32x5'6, 430 tons.

Hull 335, steel work boat, Second Pool Coal Company.

DUBUQUE BOAT & BOILER WKS.
Dubuque, Iowa

Hulls 70 to 74, coal barges, U. S. Engineers, Rock Island; 300 LBP; 50 beam; 6 loaded draft.

Hulls 75-76, 2 oil barges, U. S. Engineers, Cincinnati; 190 LBP; 30 beam; 6 loaded draft.

Hull 77, hull for towboat, U. S. Engineers, Nashville; 80 LBP; 20 beam; 4-6 loaded draft.

FEDERAL SHIPBUILDING CO.
Kearny, N. J.

Purchasing Agent: R. S. Page.

Hull 230, oil barge, Seaboard Shipping Co.; keel Jan29 24.

FRASER, BRACE, LIMITED
Three Rivers, Quebec

John C. Howard, hull 20, Lake freighter, Geo. Hall Coal Co. of Canada; 250 LBP; 43 beam; 16'6 loaded draft, 12 loaded speed; 3270 short tons DWT; TE eng, 1400 IHP, 19x32x36-36 stroke; 2 Scotch marine boilers, 14-7x10'8, coal burning; keel Apr 22; launched May5/23.

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent: Chas. Short.

Hull 245, bulk freighter, Ford Motor Co.; 586 LBP; 62 beam; 20 loaded draft; 13 mi speed; 13,500 DWT; 3300 IHP; Doxford engs; keel Nov26 23; launch April5 24, est.

Hull 246, dbl scow, M. Sullivan, Detroit; 111x30x6 feet.

Hull 247, bulk freighter, H. K. Oakes, Frank-lin S. S. Co., Cleveland; 612 LOA; 586 LBP; 62 beam; 32 depth; 20 loaded draft; 13,500 DW T; 12 mi speed; keel Mar1 24, est; deliver Oct 1 24, est.

HOWARD SHIP YARDS & DOCK COMPANY
Jeffersonville, Ind.

Purchasing Agent: Jas. E. Howard.

Steel tow boat; 140 long; 32 beam; 6½ depth hold.

Two steel river boats, U.S. government.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Pere Marquette 21, hull 209, car ferry, Pere Marquette Ry. Co.; 348 LBP; 56 beam; 16 loaded draft; 14 mi loaded speed; 2 sets TE engs, 2750 total IHP; 4 Scotch boilers, 14x6x 11; 18 lbs press; keel Oct1/23; launch Jan15/24, est; deliver March 24, est.

Pere Marquette 22, hull 210, sister to above; keel Dec20 23, launch Jan1 24, est.

Hull 211, steel barge, War Dept, U.S.gov.; 175 ft long, 40 ft molded beam; 11 ft 6 in molded depth; keel Mar 28, est.

Hull 212, steel tug, Great Lakes Dredge & Dock Co., Chicago; 75 ft long, 21 ft molded beam, 11 ft molded depth; 1000 IHP Fairbanks-Morse C0 engs; keel Jan12 24.

Hull 213, sister to above, keel Jan19 24.

MARIETTA MANUFACTURING CO.
Point Pleasant, W. Va.

Sybil, hull 137, towboat, Jones & Laughlin Steel Corp.; 165 LBP; 36 beam; 7-6 depth; 105 gross tonnage; 16x32x8 ft Tandem comp engs, western river motor; keel Aug 23; keel Oct 1 23; launch Feb21 24, est; deliver Feb1 24, est.

No name, hull 138, sister to above.

MIDLAND BARGE COMPANY
Midland, Pa.

Lonsville, hull 17, side wheel, Louisville & Cincinnati Packet Co., Cincinnati, O.; 285 LBP; 50 beam; 700 DWT; launched Dec 23.

Hull 32, townerver boat hull, U.S. Engineers, Huntington, W. Va.; 140 LOA; 43 beam; 6-3 DW T; keel Jan1 23, est; launch Feb1 24, est; deliver Feb15 24, est.

Hull 33, derrick boat hull, U.S. Engineers, Mobile; 90 LBP; 34 beam; 105 DWT, keel Feb 1 24, est; launch Mar1 24, est; deliver Mar15/24 est.

Hull 34, rail and gravel barge, E. T. Slider Co., New Albany, Ind.; 126 LBP; 50 beam; 400 DWT; keel Feb15 24, est; launch and deliver, Mar 24 est.

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Lee E. Wege.

Hulls 62-63, barges for U.S. govt; 80 LBP; 26 beam; 4 loaded draft; keel Mar1 24, est; deliver Mar12 24, est.

No name, hull 65, dredge, W. T. Hardison & Co.; 130 LBP; 30 beam; 6 loaded draft; keel Mar1 24, est; deliver June1 24, est.

Hulls 66-71, inc, scantlings, U.S. Engineers, Cincinnati; 40 LOA, 12 beam; 3 loaded draft; keels May 24, est.

No name, hull 72, deck barge, Cumberland Transportation Co.; 100 LBP; 20 beam; 5 loaded draft; launched Jan23 24.

No name, hull 73, oiler barge; sister to above.

No name, hull 74, deck barge, sister to above.

No name, hull 75, open barge, sister to above.

Hull 76, deck barge, U.S. govt., Louisville; 120x36x7'6; ft.

Hull 77, sister to above.

NAVY YARD
Boston, Mass

Whitney, destroyer tender No. 4, U.S. Navy; 460 LBP; 61 beam; 21 loaded draft; 16 knots loaded speed; 10,600 tons disp; 7000 SHP gear-ed Parsons turbines; 2 WT express type boilers; keel Apr23/21; launched Oct12 23; deliver Aug 1 24, est.

NAVY YARD
Philadelphia, Pa.

Dobbin, hull 7, destroyer tender, U.S.N.; 460 LBP; 60-10 beam; 21 loaded draft; 16 loaded speed; 10,600 tons disp; Parsons geared turbine single screw engs, 7000 SHP; 2 WT boilers, keel Dec23/19; launch May3 24; deliver July , 24, est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, W. Va.

Purchasing Agent: Jas. Plummer, 232 Broadway, New York City.

J. H. Senior, hull 273, oil tank barge, Standard Oil Co. (N. J.); 210 LBP; 38 beam; 16-6 depth; 9 loaded speed; capacity 11,000 barrels; McIntosh & Seymour diesel engs; 455 HP Westinghouse motor; keel Oct22 23; launched Jan 5 24; deliver Feb 24, est.

No name, hull 276, freight and passenger stmr, Old Dominion Steamship Co.; 375-6 LBP; 53 beam; 29-9 depth; speed 16 knots; 2100 DWT; Newport News-Curtis turbines, 4750 SHP; B & W boilers; keel Mar 24, est.

No name, hull 277, sister to above; keel Apr 24, est.

NEW YORK SHIPBUILDING CORP.
Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

No name, hull 265, bulk oil stock; 419-3 LB P; 56-3 beam; 25-9¾ loaded draft; 10¾ loaded speed; 9870 DWT; 3 cyl TE engs, 3000 SHP; 3 SE Scotch boilers, 15-10x11-4; keel Feb28 24.

Arthur S. Herron, hull 279, tug, American Dredging Co.; 100x33x12 ft; 500 BHP, Wentan diesel engs; keel Sept11 23; launched Nov26 23; delivery Feb/24, est.

Hulls 280-289, ten carfloats, Pennsylvania R. R. Co.; 250 ft long; 2 tracks; 7 delivered; 3 on ways.

Hull 290, self-propelled oil barge for Standard Transp. Co.; 260 4/6x34 feet; 2 350 BHP diesel engs; keel Dec15 23; deliver spring 24.

Hull 291, sister to above; keel Dec29 23.

Hull 292, sister to above; keel Dec27 23.

SPEDDEN SHIPBUILDING CO.
Baltimore, Md.

Purchasing Agent: W. J. Collister.

Tug A, hull 255, U.S. Engineers, Philadelphia, 50 LBP; 14-1[illegible] beam; [illegible] loaded draft; [illegible] DW T; 100 IHP Mianz engs; launched Jan11 24.

Tug B, hull 256, sister to above; launched Jan28 24.

Tug C, hull 257, sister to above; launched Feb 1 24, est.

Tug D, hull 258, sister to above; launched Feb 15 24, est.

STATEN ISLAND SHIPBUILDING COMPANY
Staten Island N. Y.

Purchasing Agent: R. I. Miller.

No name, hull 276, steel [illegible] tug-boat, Penn. R. R. Co.; 105 LBP; 24 [illegible] 13-5 loaded draft.

No name, hull 750, steel diesel electric tug-boat, Atlantic Refining Co.; 94 LBP; 21 beam; 11.5 loaded draft.

No name, hull 751, sister to above.

No name, hull 752, sister to above.

SUN SHIPBUILDING COMPANY
Chester Pa.

Purchasing Agent: H. W. Scott.

A. MacKenzie, hull 58, Bonner dredge, U.S. Engineers; 245 LBP; 46 beam; [illegible] loaded draft; [illegible] loaded speed; [illegible] DWT; diesel-electric drive; keel Mar9 23; launched Nov23 23; deliver Feb/24, est.

W. L. Marshall, hull 59, sister to above; keel Mar26 23; launched Nov29 23; deliver Mar 2 24, est.

Dan C. Kingman, hull 60, sister to above; keel June18 23; launch Feb15 24, est.

Wm. T. Rossell, hull 61, sister to above; keel June23 23; launch Mar1 24, est.

Schenectady, Socony, hull 73, motor barge, Standard Transp. Co.; 260 LOA, 40 beam; 14 depth; 2 350 BHP diesel engs; keel Dec5 23.

Amsterdam, hull 74, sister to above; keel Dec 5 23.

Rome, hull 75, sister to above; keel Dec5 23.

Oswego, hull 76, sister to above; keel Dec 20 23.

Burlington, hull 77, sister to above; keel Dec 20 23.

Hull 78, oil barge, Sun Oil Co.; keel Jan16 24

Hull 79, oil barge, N. Y. Central R. R. Co.; 144 LBP; 27 beam; 11-6 depth; 1100 DWT, keel Jan18 24

No name, hull 80, oil barge, Tidewater Oil Co.; 276 ft loa; 32 ft beam; 10 ft depth; keel Feb1 24, launch Mar22 24, est.

THE TOLEDO SHIPBUILDING CO.
Toledo, Ohio

Purchasing Agent: H. M. Ives.

William N. Field, hull 176, bulk freighter, The Penn S. S. Co., Sheboygan, Wis.; 250 LBP; 43 beam; 24 loaded draft; 12[illegible] speed; [illegible] DW [illegible] TE engs [illegible] IHP; [illegible] boilers, 14 ft., keel June2 [illegible] launched Jan24 24

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Greenbrier, hull 25, U.S. Lighthouse tender; 204 long by 32-6 by 5-2 mon cor [illegible] HP engs, 15 inch dual cylinder, 24 in stroke; 2 Mississippi River type boilers, 26 ft long, coal burning, natural draft; keel June29 23 [illegible] Nov13 23; deliver Mar24 24, est.

C. B. Harris, hull 31, 24 in pipe line dredge, U.S. Engineers, Cincinnati, O.; 175 long by 5[illegible] by 8½; pumping engs, 1000 BHP McIntosh & Seymour diesel; 2 aux 225 BHP McIntosh & Seymour engines; keel Sept20 23; launch Mar1 24, est; deliver Mar 24, est.

Tacoma, hull 32, steel hull, Cincinnati, Portsmouth & Charleston Packet Co., Cincinnati, O.; 140 long by 37 by 6; keel Jan17 24; launch April 24, est.

Lookout, hull 33, tow-boat, U.S. Engineers, Nashville, Tenn.; 116 ft long, 29 ft beam; 5-6 depth; 2 surface condensing tandem comp engs, 1000 IHP; 4 watertube boilers; coal burning; natural draft; keel Feb4 24, est.

BETHLEHEM SHIPBUILDING CORP. LTD.
Union Plant, San Francisco

Dry dock, navy, misc.: Edna G.; steamers, Texas, Romagna, Stockton, Hanna-Nielsen, R. J. Hanna, Jehanna Smith, Wm. Rockefeller, Java, Arrow, Panaman, West Ivan, Enterprise, Indian City, Priscilla, Homer City, President Hayes, H. W. Baxter, W. B. Storey, Pagan, McKittrick, Sea Scout, Iwagua, Carlos, San Pedro, Lubrizol, Charlie Watson; Tonnage openings: Akara, Tail shaft; Indian City, Ohioan; Piping: Wm. Donald, Indiana, Homer City; Cargo pump repairs: Harold Walker, Lehec; Boiler: Steel Scraper, H. Dowell, Halo; Propeller: Gulf Queen; Repairs to copper pipe: Frank G. Drum, Iowa; Engine: Cathwood, Edward Doherty, Jr., Delmore, Seattle, Colombia, Mary and, Emidio tailshaft, Tuscarora; Telemotor repairs: Marcos H. Whitney, Division plates: H. T. Scofield, Electrical: Mojave, D. C. White, Wachee, Sagillesco, President Taft, H. W. Baxter; Install oil engines: Peter-sur No. 12; Ore watershed extension: A. C. Bellotti, Sewer pool tank; Drill section, Drydock, install 2 blades; Canadian Rover; Recover type shaft; Stop ring, casting; Lubricator, Propeller, repairs: Dresden; F. A. Warner, Makena; Superheater elements: Eurana; Misc.: W. S. Miller, President Taft, Haurako, Lurline, Annette Reed, Alaska Star, and, Alden Archer, Sea, H. T. Harris, Marsteen, Rose City, C. T. Hall, President Harrison, La Habra, D. G. Scofield, Hales, Liebre, Hagen, Los Alamos.

HARBOR IMPROVEMENT NOTES

(Continued from page 182)

The third project for the port of Seattle is a bunkering terminal to be built by the Shell Oil Company of California on land purchased from the Oregon-Washington Railroad & Navigation Company on the East Waterway. The site has a frontage of 550 feet and is nearly opposite the site of the old Skinner & Eddy Shipyard No. 2.

Shipping terminals are also to be planned by the Puget Sound Bridge & Dredging Company at Seattle.

Plans for improvements in existing port facilities by the Port of Seattle Commission will include the erection of an additional shed on Pier 41, Smith Cove, and increase of cold storage facilities to take care of increased cold-storage egg shipments.

Tacoma.—The Port of Tacoma reports that during 1923 a total of 310,061,500 feet of lumber were loaded at that port in addition to 49,000,000 lathe and 30,000 bundles of shingles. The recent installation of two cargo cranes for handling lumber on the municipal dock have helped to make this one of the best equipped docks for the shipping of lumber.

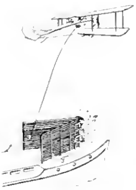
Bellingham.—Lumber shipments from Washington ports continue to increase and the port commission of Bellingham has under consideration the extension of the municipal dock and has appealed to Congress for aid in dredging. The Wyatt & Miller Lumber Company has been organized and has taken over the plant and timber of the United Cedar Company at Blaine. A pier to accommodate three vessels at one time will be built.

Grays Harbor reports shipments of lumber for the year 1923 amounted to 880,605,363 feet in 651 vessels. The oceangoing hopper dredge building at the Sun Shipbuilding Company will probably be completed in time to start dredging operations at Grays Harbor by July 1. The harbor commission has also appealed to the Department of Commerce for a light ship.

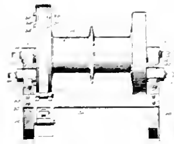
MARINE PATENTS OF THE MONTH

1,479,222. SUPPLY MEANS FOR AIRCRAFT. Godfrey L. Cabot, Boston, Mass. Filed Nov. 25, 1919. Serial No. 264,083. 14 Claims. (Cl. 258—1.)

1. In a supply means for aircraft, a pair of converging vertical walls, an anchor member to which the supplies are attached, means for holding said anchor member at the [illegible] spaced ends of said walls, a cable depending from the aircraft to be guided to said anchor member by said walls, a weight on the end of said cable, and an inclined bottom between said walls to guide the weight upwardly, provision being made for connecting said cable [illegible] member [illegible] engagement of the former with the latter.



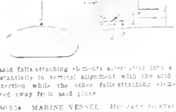
1,477,329. LOWERING AND RAISING DRUM FOR LIFEBOATS. [illegible] Seattle, Wash., assignor to [illegible] Life Boat [illegible], Inc., Seattle, Wash. Filed Dec. 31, 1921. Serial No. [illegible]. 2 Claims. (Cl. 254—150.)



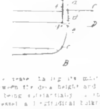
1. A hoisting mechanism comprising a drum, means for rotatably supporting the drum, an annular flange formed with said drum terminating in an internal ring gear concentric to the drum, and the outer surface of said ring gear being formed with a plurality of circumferentially spaced notches, an annulus fitted about the ring gear, a roller in each of said notches adapted to permit the ring gear to rotate in one direction with relation to the annulus but to lock the ring gear against rotation in the opposite direction with relation to the annulus, an adjustable friction band about said annulus, a spindle rotatably supported and carrying a pinion in constant mesh with said ring gear, and said spindle being adapted to be manually rotated to move said ring gear in either direction.

1,474,548. LOWERING AND RAISING APPARATUS FOR SHIPS' BOATS. Harry W. Beatty, [illegible], N. Y., assignor to American Balsa Company, Inc., a corporation of New York. Filed Jan. 22, 1920. Serial No. 353,207. 6 Claims. (Cl. 9—[illegible].)

1. In apparatus for lowering and raising ships' boats, the combination with a davit arm, of a falls-attaching device having a connection with the outer end of said davit arm, and also having elements spaced from each other for attaching double falls, double falls attached to said elements, said device being movable to swing each of said falls-attaching elements alternately into a plane substantially in vertical alignment with the said davit connection while the other falls-attaching element is moved away from said plane.



1,460,534. MARINE VESSEL. Hermann Gustav Carl Frahm, Hamburg, Germany. Filed Jan. 24, 1922. Serial No. [illegible]. [illegible] Claims. (Cl. 114—12[illegible].)



1. A marine vessel having its main plating curved outwardly between the deck height and bilge, the entire [illegible] curvature being substantially [illegible] the normal water line of the vessel, a longitudinal bulkhead fitted internally to said main plating so as to enclose a space between the curved plating and bulkhead and apertures in said curved plating for the free ingress and egress of water to and from said space.

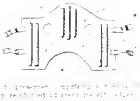
1,481,144. LIFE SAVING BELT OR PRESERVER. Albert Pastor, Alpha, N. J. Filed Apr. 30, 1923. Serial No. 635,578. 1 Claim. (Cl. 9—17.)

In a life belt or preserver, a set of independent air compartments adapted for engaging the shoulders and waist of the user, a filler stem for one compartment, means of communication therefrom to the remaining compartments, and means for securing said compartments to the user, said compartments each consisting of a tube member, a flexible reinforcing layer formed from a spirally wound strand of wire encircling said tube, and a casing enclosing said reinforcing layer.

1,481,512. BOAT PROPELLER. [illegible] Kelly, Kalamazoo, Mich. Filed June 15, 1922. Serial No. 646,115. 5 Claims. (Cl. 115—18.)

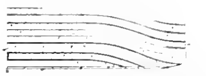
5. In a boat propeller, the combination of a frame, a propeller shaft mounted in said frame and provided with a propeller, a driving lever [illegible] said frame, said lever being provided with a segment [illegible] driving gear [illegible] with said segment, a [illegible] gear [illegible] driven gear and propeller shaft.

1,480,417. LIFE PRESERVER. Thomas [illegible], East Orange, N. J., assignor to Federated Engineers Development Corporation, Jersey City, N. J., a corporation of Delaware. Filed May [illegible], 1922. Serial No. 567,915. 5 Claims. (Cl. 9—17.)



1. A life preserver comprising [illegible] buoyancy [illegible] integral head supporting extension [illegible] of the upper edge [illegible] top [illegible] body [illegible] shoulders [illegible] extension.

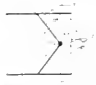
1,477,646. SHIP. Myron F. Hill, New York, N. Y. Filed Mar. 27, 1919. Serial No. [illegible]. Renewed May 9, 1923. 9 Claims. (Cl. 114—72.)



1. In a ship, horizontally disposed strakes of plates each composed of separately formed integral units each having its greatest dimension lying lengthwise of the hull, and including a plurality of stiffeners such as frames or floors disposed across the said greatest dimension.

1,475,925. RUDDER. [illegible] New York, N. Y. Filed June 7, 1922. Serial No. [illegible]. [illegible] Claims. (Cl. 114—145.)

1. In combination with a ship including a propeller and a hollow rudder post, a rudder of the character described comprising a casing open at both ends fixed to the rudder post in alignment with the propeller, said rudder post being mounted for rotation about a vertical axis, members rotatably mounted in the hollow rudder post and extending into the casing, gates attached to said rotatably mounted members, and means for operating the rotatably mounted members to operate the gates to close the casing.



1,45[illegible] [illegible] Milwaukee, Wis. [illegible] Claims [illegible]

1. In an internal combustion engine, a reversing gear having a rotatable shaft, a self-actuating rocker element mounted thereon for rocking movement [illegible] forward and reverse [illegible] and means [illegible] shaft [illegible] of either of said frame.

1,479,351. LIFE PRESERVER. [illegible] Halifax, Nova Scotia, Canada. Filed Feb. 23, 1923. Serial No. [illegible]. [illegible] Claims. (Cl. 9—17.)

[illegible] pair [illegible] edge [illegible] for [illegible] said [illegible]

1,48[illegible] [illegible] Wesley [illegible] N. Y. [illegible]

1. A [illegible] vibrat[illegible] diaphragm [illegible] central [illegible] said [illegible]

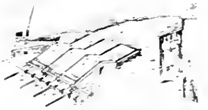
1,481,527. DRIVE MECHANISM FOR PADDLE WHEELS OF BOATS. [illegible] and Warren Elsey, Pittsburgh, [illegible] 1922. Serial No. [illegible]. 4 Claims. [illegible]

1. In a power [illegible] of the boat [illegible] and a paddle-wheel [illegible] said track [illegible] carried by the boat [illegible] the space between [illegible] sustained by said [illegible] shaft journalled [illegible] shaft and [illegible] the paddle-wheel axle.

1,479,[illegible] Thomas [illegible] 192[illegible]

[illegible]

1,481,[illegible] [illegible] Frank [illegible] 1922. Serial No. [illegible]



1. Apparatus [illegible] comprising in combination [illegible] means for drawing lumber from a ship [illegible] means for carrying the lumber [illegible] means for moving the conveyor [illegible] surface of the platform, a ramp [illegible] lumber from the platform [illegible] means.

1,47[illegible] GAUGE FOR INDICATING THE DRAFT OF SHIPS. [illegible]

[illegible] draft gauge [illegible] comprising a hollow body adapted to be water immersed, means for suspending same from a ship, a valve permitting entry of water [illegible] when immersed, means [illegible] the valve [illegible] and means [illegible] from the ship for releasing [illegible] means and thereby permitting the valve [illegible] water [illegible] the body, substantially as described.

1,480,[illegible] LOADING PLATFORM AND WHARF ARRANGEMENT. Benjamin [illegible], Houston, Tex. Filed June 17, 192[illegible]. Serial No. [illegible]. 12 Claims. [illegible]

1. In combination [illegible] main line [illegible] substantially parallel with said main line, a plurality of switch tracks, diverging at an angle from the main line, separate switch tracks [illegible] the respective platforms [illegible] the edges of said platforms [illegible] the respective switch tracks being substantially parallel with the [illegible] respective [illegible] tracks [illegible] with respect to the main line.

[illegible] SHAPING [illegible] 1922 [illegible]

[illegible]

The Future of the United States Merchant Marine—II.

(Continued from page 163)

merchant ship, and if most of the eighty or one hundred thousand men which are now employed on board our war vessels were drafted into the merchant marine, and if the Navy Department paid, if not the whole of their wages, at least a substantial portion, they could be usefully employed and learn more actual work than they would on board of a war vessel, while at the same time saving the American shipowner the considerable difference between the payroll of an Ameican vessel and that of a foreign vessel.

A suitable method would have to be found enabling the shipowner to exercise the necessary discipline over these men who, while receiving most of their pay from the Navy Department, might not feel themselves under the same sense of duty towards the owner of the vessel which would exist on the part of the crews who are entirely paid by the shipowner, but this is a matter which would not be difficult to adjust.

Subsidy

A subsidy for American vessels will no doubt be brought up again sooner or later. American shipbuilders who have exercised considerable influence in Washington, and who want to build more ships, will see to that.

The building of a merchant ship in America is necessarily more expensive than in Europe, and the large number of shipyards under such influential direction as C. M. Schwab, Homer L. Ferguson, the Sun Oil and F. W. Harriman and others are bound sooner or late to initiate steps to get their expensive establishments into profitable work again. It would be quite impossible to do this without direct or indirect government help. When this help has been secured, even the vessels which are now laid up and which may by that time have been refitted with diesel engines will probably participate in the subsidy or whatever form the government support assumes.

Shipping Finance

In these circumstances, it would seem to me to be well worth the consideration of capitalists to give serious consideration to the prospects of mobilizing the laid up Shipping Board fleet with economical motive power. I have already indicated that this problem should be solved in an essentially American manner, that is, on a large scale.

Shipping companies in England, France, Germany, Italy and Holland are in close touch with the principal financial institutions of the respective countries. The shares of the Peninsular & Oriental Company, Royal Mail Company, Furness-Withy & Company and other large shipping concerns in England are quoted on the same levels as the highest class securities and at present quotations show a bare 5 or 5½ per cent interest.

In the United States, however, high finance has had many disappointments in connection with shipping. In the first place, Mr. Morgan's ill-advised flotation of the International Mercantile Marine Company, the constituent parts of which were bought at highly inflated prices, has left a very bitter taste in the mouths of many big financiers. Quite recently, the 6 per cent bonds of that institution, which are covered by substantial assets at least five times over, were quoted at less than $80, while many other bonds not connected with shipping, and having less security, and carrying the same rate of interest, are quoted above par. This fact shows glaringly how high finance has turned a cold shoulder towards shipping enterprise. Then again the first attempts after the war to float American shipping companies, for instance, the Green Star Line and many similar concerns which bought ships at highly inflated prices on a falling market, has been a severe disappointment to such financiers as interested themselves in these companies. Nevertheless, the experience of the past is no proof that shipping enterprises in themselves, when conducted by competent managers, are unsound, as else they would not receive the support of high finance in foreign countries.

The Laid-up Fleet

The question now arises how the Shipping Board had best dispose of this laid-up tonnage, and also of the 400 vessels which are now being operated by various firms. The operation by the Shipping Board of 400 vessels leaves an annual loss of about $50,000,000. The prospect of reducing this loss out of increased earnings is not favorable. The value of the whole of the Shipping Board fleet, consisting of say 1200 vessels, partly now running and partly laid up, and of an average deadweight tonnage of 8500, and valued at an average price of $30 per ton deadweight capacity, is about $300,000,000. It follows, therefore, that if the Shipping Board continues to operate these 400 vessels under present conditions, it will have sacrificed the whole value of its present fleet, and that it would be better from a purely financial point that the Shipping Board should sink all the 1200 vessels than to operate even the 400 longer than the next six years. But all this loss could be avoided, and at least part of the $300,000,000—the present value of the fleet—could be realized if the Shipping Board proceeded to deal with the problem aside from politics and on sound business principles, and if it refused to be guided by parties who have private interests at heart rather than those of the country at large.

One thing which the Shipping Board might do in selling those vessels which are now running on regular lines to the operators would be to give the operators such credit as might be required to carry through this transaction and to underwrite insurance on the vessels against total loss, collision and general average at a nominal rate, leaving the operators to take their own risk in regard to particular average.

The Shipping Board should also express its willingness to finance the conversion of the steam power in these vessels to diesel engine power on a comprehensive and standardized principle.

Tramp Service

I assume that the vessels now so operated are as many as can find employment on regular lines and the rest of the laid-up Shipping Board fleet would at least in the beginning have to be employed as tramps or in general trades, wherever the best freights may be procurable. There are at least 5000 steamers so employed under the British, Norwegian and other flags, and there will always exist a necessity for a considerable amount of tonnage for this purpose on account of the harvests in different parts of the world which have to be marketed and shipped as soon as practicable after the crops have come in. Thus, for instance, the rice harvest is generally moved within six weeks or two months of harvest time. The

(Continued on page 43)

AUXILIARIES—MARINE EQUIPMENT

(Continued from Page 176)

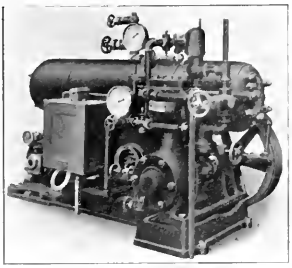
A SELF-CONTAINED REFRIGERATING UNIT

WITH an engineering and distributing organization covering every important seaport in America as well as all the large inland centers, the York Manufacturing Company are in position to extend refrigerative engineering service to marine engineers and shipowners. As the result of many years of practical and scientific experience and research in the refrigerative field, this corporation has developed a self-contained unit for refrigerative plants which embodies compactness of design and ease of installation together with all those refinements of mechanical detail which have made the reputation of York apparatus.

This machine is made with an ammonia compressor of either one or two cylinders for one or two ton rated capacity. It is arranged for belt drive so that it can be operated by electricity, oil, gas, gasoline or steam power; which means that you are enabled to use whatever power is most convenient to you wherever you are, and that if you move and find it more advantageous to use some other driving power, the machine, without alteration in itself, is adapted to the change. Motors are belted direct to the compressors and are furnished to suit the electric current characteristics available for operating the units. The controls for these motors are varied as the different types of current used may require.

The compressor discharges directly into the horizontal shell and tube condenser, acting also as a receiver. By contact with the shell and tubes through which the cooling water flows, the ammonia gas is condensed into liquid and collects in the lower portion of the shell, from which it is expanded into the evaporating or low pressure side of the system. The tubes are expanded into tube-heads in the usual manner and fitted with water return bends in such way that each tube forms a pass, giving the water the longest possible passage, consequently the most time to absorb heat while passing through the condenser. Over the tube-heads are bolted the water-heads to which the water connections are made.

The water regulating valve is located near the water inlet end of the condenser and is the type actuated by the varying pressure of the gas in the condenser.



The York refrigerating unit, showing compactness and accessibility of control

The control referred to above is usually considered as semi-automatic. On special order full automatic controls can be furnished, including thermostats of the type suitable for the installation, and liquid expansion valves controlled by the pressure in the evaporating coils.

These units are protected in every possible way from conditions which may result in damage to itself or surrounding property. If the cooling water should fail, the pressure in the condenser will immediately rise, but only to the point at which the excess pressure cut-out is set to shut down the motor, and the motor will not resume operation until the cut-out is reset by hand. Should the current supply fail, the low voltage release device will open the switch and when current is resumed the regular starting method will automatically proceed. Adequate line fuses should be used to protect the unit from heavy stray currents. The motor is protected from being unduly heated by a thermal overload device which releases the starter and stops the motor when an excess current is taken by the motor. If by any accident the motor should become overloaded this thermal overload protection acts, and must be reset to start again. Should the compressor be accidentally started before the discharge stop valve is opened the excess pressure cut-out will function and immediately stop the motor. An added protection from excessive pressure is the relief valve on the discharge side of the compressor.

An individual analysis of every installation is necessary before estimates on the cost and advisability of installation are possible. Interested parties can secure, without obligation, the advice and cooperation of the York organization by addressing the nearest branch.

AN INTERESTING MODEL

PROMINENT yachtsmen, architects and shipbuilders expressed keen interest in the Westinghouse model of the diesel electric drive at the motorboat show. The model consists of several automobile motors directly connected with the small generators, these sets

Model of the Westinghouse electric drive on display at the New York Motorboat Show

generating the power for a motor which is directly connected to a propeller in a tank of water. A small control was located where the visitors to the booth could easily start the propelling motor and change it from full speed ahead to full speed astern in a very few seconds.

Many expressed their approval of this system of pilot house control and in several cases mentioned accidents that could have been avoided by the pilot having direct control over the propeller instead of depending upon signals given to the engine room.

Trade Literature

The Kidwell Two-Flow Ring Circuit Water Tube Boiler, by Edgar Kidwell, M.E., Ph.D. 275 pages copiously illustrated; bound in brown board with black and red stampings; published by the Kidwell Boiler Company, Milwaukee, Wisconsin.

This book contains "a lucid explanation of the principles underlying correct boiler design and operation, their application to boiler analysis and how they are applied in the design of the Kidwell boiler, with other information valuable to those who wish to generate more steam for less money."

If there be doubt in the mind of any steam engineer as to the possibilities for improvement still remaining in existing boiler design, the first chapter of this work will absolutely remove that doubt and show that nearly all our progress in boiler practice has been along strained and unnatural lines. In the design of the Kidwell boiler the inventor has returned to the natural laws governing the circulation of heated liquids and vapors, and has produced a type of boiler which is showing very marked improvement in real economy of steam generation.

We are much intrigued with the dedication page of this volume giving honor to a long forgotten friend of ours who was not only a great designer of steam boilers but was also among the pioneers of automotive engineering. Set on a diagonal square and imprinted over a vivid green crown of wild olives is the following:

"To the honor and memory of Goldsworthy Gurney of Cornwall, a pioneer investigator in the generation of steam, who through the divine inspiration of genius realized more clearly than any other man of his time or since the necessity and effect of rapid water circulation in boilers and who nearly a century ago discovered the only adequate method of producing it and then gave to the world the principle of ring-flow circulation, this volume is reverently dedicated by the Kidwell Boiler Company, which values beyond price the privilege of rescuing from oblivion the work of this great and previously unappreciated genius and of carrying to completion the task which he so efficiently and nobly began."

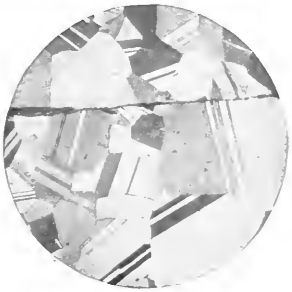
The table of contents shows that there are nine chapters devoted respectively to: first, "The reason for, purpose and plan of this book," six pages; second, "The general principles underlying correct boiler design and operation," eighty pages; third, "A few applications of the preceding principles," fifty pages; fourth, "Evolution of the ring circuit boiler," ten pages; fifth, "Requirements of a perfect steam boiler and who should select and operate it," ten pages; sixth, "The Kidwell two-flow ring circuit boiler," sixty-two pages; seventh, "Chimney stacks for water tube boilers," twenty-eight pages; eighth, "Bibliography"; and ninth, "Index."

Paragraphs are all numbered and carefully indexed under subject headings. The entire book shows great labor and care in the compilation and is a typographical gem. It claims to be only a hurried advance preliminary edition of a larger and more complete work, for the appearance of which we shall certainly look with interested anticipation.

The Kidwell Boiler Company is represented on the Pacific Coast by Hunt, Mirk & Company, Inc., of San Francisco, who have a limited number of these books for distribution to interested parties.

Manual of Instruction for Welding Operators. This manual contains a complete set of outlines of lessons, exercises and examination for the training of oxy-acetylene welders and electric arc welders. In the outline of lessons a great deal of care has been exercised to provide a logical development of welding instruction, and to give reading references which will enable the instructor and student to secure full information on every topic in the outline. The exercises in each course start with an exercise in setting up the apparatus for welding, and carry the student through the more general operations, then provide special exercise typical of the work done in some of the more important industries which are large users of the welding processes. Lessons and exercises are supplemented by lists of general and special examination questions. These questions may be made to serve a three-fold purpose. The instructor can use them to determine how much the student has gained from his course of instruction; the employer can use them to determine the ability of the applicant for a welding position, and the welder himself can use them as a check on his own knowledge of the work which he is doing.

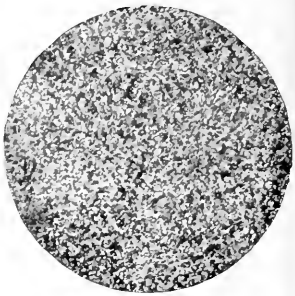
Locking the stable after the horse is stolen



MAGNIFIED 75 DIAMETERS

FIG. 1
Condenser Tube which failed after 5 months service Unsound metal.

FIG. 2
Scovill Fine Grained Cup Drawn Admiralty Condenser Tubing.



MAGNIFIED 75 DIAMETERS

PREMATURE FAILURES of condenser tubes can often be prevented by using modern methods of testing this material before it is installed.

For example, a certain installation of condenser tubing leaked so badly after being in operation only six months that it had to be replaced.

A microscopic examination of the defective material showed the existence of large gas pockets below the surface of the metal. Refer to Fig. 1 (above) which is a micrograph of the longitudinal edge section of one of the defective tubes. The black horizontal line is the gas pocket. Compare this with Fig. 2, which represents fine grained cup drawn tubing. Unsoundness of the metal was responsible for this loss in service.

Condenser tube users can be assured of a thoroughly tested product by specifying Scovill Cup Drawn Admiralty Tubes. Unsound material cannot creep into tubes made by the cupping process, because unsound metal cannot stand the transverse strain involved in transforming a thick sheet of wrought brass into a cup. The use of brass melted in electric furnaces, chemical analysis of each heat, and accurate control of the heat treatment result in a product made on an engineering basis and designed to give long uninterrupted service. Our tubing is subjected to the air, hydraulic, mercury, expansion and microscopic tests before it is shipped to the customer.

May we figure on your next installation?

SCOVILL MANUFACTURING COMPANY

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224 W. Lake St., Chicago
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Pacific Coast Sales Agent:
ENGLE-REID CO.
149 California St., San Francisco
Terminal Sales Bldg., Los Angeles

SCOVILL CONDENSER TUBES

Member, Copper and Brass Research Association

PLEASE MENTION *PACIFIC MARINE REVIEW* WHEN YOU WRITE

(Continued from page 38)

grain harvest in the Black Sea is mostly moved in the autumn before the closing of navigation. The fruit harvests of Sicily and Spain have to be moved at stated periods. This trade is therefore not one which can be profitably carried on by regular liners, but will at all times need the assistance of the tramp ship.

Now, it would be by far most economical to have big companies buy up the laid-up Shipping Board vessels as they are fitted with diesel engines and then to employ them as tramps. To have this carried out by small shipowners would be uneconomical for various reasons:

Firstly: A large company could carry its own insurance, and this would be an enormous saving.

Secondly: In a large company the administrative expenses per ship would be considerably reduced.

Thirdly: The purchase of stores, provisions, etc., could be done more economically if carried out on a large scale. In fact such a company could have its own stores at several of the principal ports and could establish its own agencies, thereby saving money and assuring honest and efficient representation, provided, of course, that a reliable and experienced personnel were engaged in connection with such a scheme. There are already engaged in this business several successful firms who would only need the support of high finance to carry this plan into effect.

Lastly: The idea to do this on a large scale would be entirely American and would correspond to the successful organizing ideals which have been so successfully established in this country in connection with so many other industries.

Operation by Navy Department?

In reference to some recent suggestions to turn over the management of the Shipping Board fleet to the Navy Department possibly in the hope that that department may be able to run the vessels more economically, it seems strange that there should be responsible politicians who do not understand the difference in psychology between a government official and a business man.

In no part of the government service is it the duty of a government official to earn money for the government, while the whole crux of business is the question of earning. Men trained up in government service may be economical, but there is a vast difference between wasting little money and earning money.

It goes without saying that the large number of vessels which are being run in this country for private account are all earning some little money, because as soon as a voyage ceases to offer a reasonable prospect of a profit, shipowners lay up their vessels. Now these vessels are continuing to run in spite of the fact that a very large proportion are much older and more out of date than the Shipping Board vessels; still these 400 modern Shipping Board vessels, the flower of the flock, because the less efficient are laid up, continue to lose.

The principal reason for this is that among the officials of the Shipping Board there are very few, if any, who have had a regular commercial training. To go from the Shipping Board to the Navy Department with this proposition would be like going from the frying pan into the fire. It is to be hoped that the majority of the legislators will realize these facts.

Pacific Marine Review

The Marine Journal

APRIL, 1924

Official Organ
PACIFIC AMERICAN

Official Organ
SHIPOWNERS' ASSOCIATION

BUSCH SULZER

Announcing Completion of Six 2500 B. H. P. Diesel Engines

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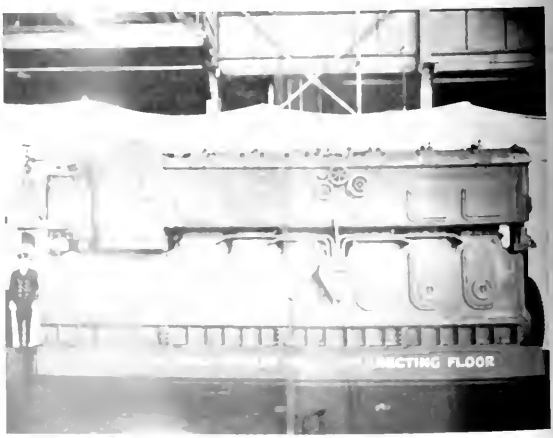

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Sales Office --- 60 Broadway N. Y. --- , San Francisco

Pacific Marine Review

The M...

APRIL, 1924

Official Organ

Pacific Marine Review, Vol. 21, No. 4 Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. $2.00 a year.

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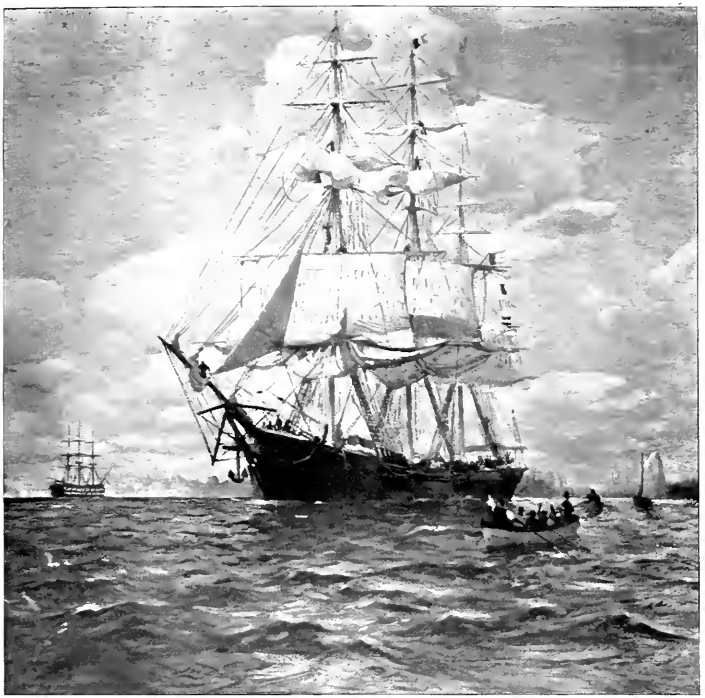
APRIL, 1924



From photo of paintingby C. R. Patterson as hung in the Winter Exhibition of the National Academy, New York, 1923.

"The Gold-Seekers—1849"

Vol. XXI APRIL, 1924 No. 4

Pacific Marine Review

THE NATIONAL MAGAZINE OF SHIPPING
576 Sacramento Street, San Francisco
339 AT 30 CHURCH STREET, NEW YORK

J. S. HINES, Publisher
A. J. DICKIE, Editor
PAUL FAULKNER, Publicity Manager
BERNARD N. De ROCHIE, Business Manager

Official Organ of the Pacific American Steamship Association and the Shipowners' Association of the Pacific Coast.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879.

Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 20th.
Subscription price, a year (domestic)..... $2.00
(foreign)..... 3.00
Single copies ..... .25

THE AMERICAN MERCHANT MARINE

An Analysis of the Present Problems Facing American Shipowners and Some Suggestions for their Solution

By JOSEPH E. SHEEDY
Vice-President, Emergency Fleet Corporation

ON February 16 last, Joseph E. Sheedy, vice-president of the Emergency Fleet Corporation of the United States Shipping Board, delivered an address on "The American Merchant Marine," before the United States Army War College at Washington, D. C. After a masterly review of the pre-war history of American marine activities back to early colonial times, Mr. Sheedy plunged directly into his subject as follows:

America's ocean carrying trade is the most important in the world today, amounting in the year 1923 to over six and a half billion. It is generally estimated that the freight and insurance charges approximate 7 per cent of the value of the products. This will give some idea of the prize at stake, leaving out of consideration entirely the value of these vessels in our national defense. It would seem the part of wisdom to enact directly effective legislation for the protection of our shipping without further delay. Secretary Hoover, in his address to the American Marine Congress in New York some months ago, made the following statements which I commend to your close attention:

"It is simply a truism to say that we must have an American merchant overseas marine.

"We must have ships if we would expand our exports on sound lines, and we must have them as an auxiliary to our national defense.

"Our international trade is one of the very foundations of our standards of living.

"We need a constant expansion of our export markets to give stability to our internal production by a wider range of customers.

"To secure export markets we must have some sound proportion of American controlled shipping to assure us against combinations in rates which would prejudice our goods in competitive markets. Nor have our merchants been without the experience of finding that the transport of our goods in foreign bottoms has been taken advantage of by our competitors to learn the details of our trade connections.

"Combinations in control of sea rates are the commonest thing in the world shipping fabric.

"It is just as important to the farmer to be guaranteed reasonable rates of sea transport as of land freight. The real security is an American-owned merchant marine."

Our chief maritime rivals have been established for years; have firmly entrenched themselves in their respective trades; and have built up by efficiency and careful service a goodwill of inestimable value and which kept them going even during the period of greatest depression by reason of the commercial momentum which they had acquired during their years of operation. The vast coal exports of England and the great business enterprises which English capital had established in distant lands furnished cargoes which have greatly aided British shipping.

Restrictions Imposed by Law

In order to promote the development of a native and loyal personnel, our laws require that only citizens of the United States shall be licensed as officers in our merchant marine. Because of this our licensed officers receive, and are not begrudged, a wage nearly twice that which foreign officers enjoy. To encourage our vital industry, shipbuilding, Congress imposed a duty of 50 per cent on repairs made abroad and, until the war, required that no ship could fly the American flag unless she was the product of American shipyards. We cannot cavil at the wisdom of these requirements; they are imposed for the general good of the country and especially for the national defense in time of emergency, but they do not render to the shipowner any advantage commensurate with the increased cost which they involve and which he must solely bear. The unwisdom of expecting private capital to bear for the national welfare a greater charge than would be imposed upon that capital did it seek investment in ships under a foreign flag is shown by the pre-war situation when our greatest passenger fleet, our oil fleets, our steel fleets, our fruit fleet, and such few tramp steamers as we owned, were almost wholly under foreign flags, although owned by American citizens.

Great difficulty exists in this country in raising capital to encourage our shipping. While American money has been invested in foreign flag ship lines, American maritime securities are little known in this country. There are many and good reasons for this. In the first place, due to our high standard of living, labor in this country receives a much greater wage for a given amount of work than it does in any foreign country;

therefore, the initial investment in ships must be greater, and in fact it costs 25 to 30 per cent more to build a steel vessel in this country than abroad. This follows in the cost of all materials as well as the actual construction and the difference involves a burden in the shape of higher insurance, depreciation and interest charges which must be carried through the entire life of the vessel. We pay our licensed personnel on freighters about twice what the foreign companies do—a matter of $10,000 per year per vessel. It will thus be seen that the investor must meet much higher annual capital charges than our foreign competitor.

Government Aid Necessary

In the face of existing conditions, since an American merchant marine cannot be obtained through the natural workings of supply and demand, it is necessary for the taxpayer, if he is to receive the benefits of American competition in our foreign carrying trade, to bear in some manner the differential between our costs and foreign costs. This fact has been clearly realized for many years. The question of how best to absorb this differential and develop the great industry of American shipping is one on which it has not been possible to secure general agreement.

It is certain that until some method is devised and put into effect in order to more nearly equalize the differential between costs of shipbuilding, maintenance and operation of American and foreign ships, we cannot hope to succeed. The sheer force of determination and the will to do cannot overcome the handicap attaching to the American ownership of American merchant ships.

As pointed out heretofore, one of the chief reasons for the success of foreign flag vessels and their ability to build up established trade lines is the help given them by their governments. England, Germany, France and other European govenments always have subscribed heavily to the building of ocean tonnage, cases being known where three-fourths the value of vessels is loaned to responsible lines at an interest rate of 2½ to 3 per cent over periods of twenty to thirty-five years. Another method is for the government to guarantee the loans made by private companies for the building of ships. As far as the financial aspect is concerned, the effect is that for every ship we can build in this country, our foreign competitor can build four, taking into account the lower percentage of cost of construction abroad. Public sentiment and opinion, to say nothing of self-preservation, forces the foreign governments to subscribe to their merchant marine, more especially in England, and not only are the people at large interested, but they are enthusiastic and well informed about the subject. Their press is always favorable to and insistent on any movement which tends to improve and protect the merchant marine, while ours is generally indifferent and, outside of our trade journals, which the general public does not read, they are frequently antagonistic. One is impressed with the knowledge the average Britisher possesses of marine affairs in general, while in our country it is a subject little known among the laymen.

I feel, however, that the American people are gradually being stirred to a realization of the necessity of establishing and maintaining our complete national independence by having our own ships on our own lines carrying a reasonable proportion of our legitimate commerce to all parts of the world, but until a larger number learn to know the difference between foreign propaganda and genuine American necessity, we cannot hope to receive the support for proper legislation to make our obvious needs into laws.

It must be realized that our war-built fleet is not in all respects unsuited for certain trades. Types of vessels for economy in service change like the seasons' styles. The greater portion of our laid-up fleet is not suitable for operation in competition with the fast increasing numbers of modern foreign flag vessels Those more desirable types we have been using to establish more important routes and trade in the North Atlantic, United Kingdom, Mediterranean, South American, Pacific Oriental, African, Australian and East India routes, represent but a small part of the total war-time fleet, and these have been maintained and run as efficiently as they have been through concentrated efforts to effect all the economies possible, that the best ship engineering talent in America could devise. We have made strides in foreign trade that must not be allowed to lose ground. It has been effected at a loss, as everyone knows who cares to know, but time and effort and the proper support of the merchant marine will turn the tide and, even as it is, it is doubted if our losses in the past few years have been much greater than our competitors', nor have they exceeded in all probability the increased freights which American shippers would have had to pay had American vessels not been on the seas to afford competition and keep the markets open to American industries.

We can and will gradually force a recognition of our purpose and ability to stay in the game, and then we can formulate more satisfactory trade agreements, and, through our foreign representatives, forestall any attempts of violation, such as has usually happened in the case of past arrangements.

Maintenance Cost of Idle Fleet

We continually hear and read suggestions for scrapping our laid-up fleet, many reasons being given, the principal one being that it will assist in stabilizing trade and will reduce the losses to the government fleet through the elimination of expenses in caring for these vessels. The total cost of maintaining the laid-up vessels of the war-built fleet of the government under the control of the Shipping Board during the fiscal year 1923 was $2,818,000. In this fleet were approximately 1000 vessels, half of which, with the slightest up-turn in trade, would be in use and are as good as similar vessels of our competitors; and the entire fleet has the advantage of being approximately eight years younger than the average vessels of our competitors. The total annual expense of maintaining this fleet represents less than the actual cost of two vessels of moderate size, and while many of them may not be desirable for competitive trading, in time of national emergency they could all be used, as vessels of an inferior design were used during the World War.

The effect on trade of scrapping the undesirable vessels is, to my mind, purely fantastic, as if there is only business for 400 ships, another 400 has just as much effect on keeping down the market as 1000, and up to date nobody has suggested scrapping more than 250 ships.

Conversion Program

There is now before Congress a bill submitted by Congressman Edmonds to make the moneys in the construction loan fund available for the purpose of converting vessels of the government-owned fleet to diesel engine propulsion. With the passage of this bill a liberal fund will be provided to convert some of the more desirable hulls of the government fleet, now equipped with uneconomical types of machinery, into real

producers. This program will provide much needed work to keep together the very necessary shipyard organizations which are at present in a rather uncertain position. Such application of this fund would most assuredly be more beneficial to the future of the American merchant marine than would the proposed scrapping program viewed so complacently by our competitors and would be giving us vessels of modern construction fit to compete with those which have been put forth by foreign shipyards within the last few years.

During the time that we have been so freely advised by our competitors, and many interests in this country, that the only solution was the scrapping of this laid-up fleet, in Great Britain and the British dominions in the years 1922 and 1923 1,800,000 gross tons of shipping were built by our chief competitor, while it is so freely suggested that we destroy our club over the trade of the world, by far the greater part of which Great Britain has commanded for the past fifty years. These figures speak for themselves. I call particularly to your attention that Britain has built in the past two years approximately 1,500,000 tons more than the United States, and a great many of them motorships of the latest design.

The latest figures available show that the American merchant marine under private ownership consists of 1109 vessels over 1000 gross tons, the total tonnage being 5,092,540 gross. The separation into class is 161 passengers, 614 freighters, 334 tankers; 77 of this number of all classes in overseas foreign service, 183 nearby foreign, 688 coastwise, 161 laid up.

The government-owned vessels of over 1000 gross tons number 45 passenger, 1209 freighters, and 52 tankers, or 1306 in all with a total gross tonnage of 6,465,351. Of these, 365 of all classes are in overseas foreign service, 12 nearby foreign (4 of which are Panama Railway vessels), 23 coastwise, and 906 laid up.

American flag vessels in all classes and services are therefore 206 passenger, 1823 freighters, 386 tankers, total 2415, with a gross tonnage of 11,557,891. Of this number, 1067, with a gross tonnage of 4,477,156, or approximately 40 per cent as to tonnage, are laid up, many of which on account of type, condition or size will never be used under normal trade conditions.

It is certain that the diesel or heavy oil internal combustion engine is here to stay. The foreign ship lines were quick to realize the advantages over the steam powered vessel and many motorships are already in operation and building at the present time. The American motor fleet is negligible in numbers. The government owns one such vessel, namely, the William Penn, now operated in the Far East trade. It may be interesting to note that the fuel bill for the operation of this particular motorship is about one-third of that consumed in a turbine and gear or reciprocating engine installation in the same size vessel, and you can well imagine what this would mean in a saving in the fuel bill over a period of one year, especially when you take into consideration the number of ships operated by the Emergency Fleet Corporation.

After each of our wars the history of this country shows that the wage level has never returned to the pre-war conditions, and it was a matter of seventeen years following the close of the Civil War before the increase in the wage level was checked. The standards and wages of the American mechanic gradually drew away from those of the foreign mechanic and with them correspondingly went all costs in industry. In our country every other industry has had protection during its pioneering days or in times of stress when threatened by foreign markets. This shipping has been denied.

Most of the objection to the enactment of legislation for the protection and benefit of the American merchant marine has been from the Middle West. A study of the exports of our country indicates that by far the greater part of our exports originate in the Middle West, and this includes not only the agricultural products, but manufactured products as well. This being the case, the stabilization of a low rate making possible the export of the products of the Middle West would in itself seem justification for the encouragement of the merchant marine. In the Gulf the freight rate on cotton, due to the presence of government-owned ships, has admittedly been approximately one-half of what it would have been if our ships had not been there.

Therefore it can readily be seen that a merchant marine cannot rightfully be considered as the separate institution which a large portion of the public, and unfortunately of the press as well, has persisted in regarding it. It is an integral part of a well rounded industrial world, and as such must be encouraged if the other industrial factors are to be properly protected.

The ultimate end, of course, should be a merchant marine privately owned and privately operated, but if the choice comes down to a merchant marine governmentally operated or no merchant marine, there can be no question in the minds of any true American as to which it should be.

I do not need to dwell upon the value of a merchant marine from a defense standpoint, but will simply state that our merchant marine should be balanced by the addition of fast passenger and freight vessels capable of handling troops and ammunitions of war should occasion require. Can it be possible that the American people are going to forget the lesson of unpreparedness which they were taught to the tune of $3,500,000,000 only a few years ago? The direct and indirect aids which have been suggested in order to maintain our flag upon the seas would be but a mighty small interest rate upon the $3,500,000,000 spent in times of stress for the safety of our country. It is almost unbelievable the indifference shown on the part of the American people to the seriousness of this problem, and unquestionably it is the duty of the officers of the Army and Navy, as the defense arms of this nation, to assist in educating the people to the necessity for an American merchant marine and to the even more important necessity of patronizing it, and also to assist the Shipping Board in its efforts to secure constructive legislation.

In the sixty years that have elapsed since we were admittedly without peer on the seas, what have we done with our heritage? Prior to the World War we carried 9 per cent of our products, and our present position was forced upon us by the conflict. This is our opportunity and we should grasp it. We have resources and wealth beyond conception to found and maintain an American merchant marine. Are we going to benefit by and hold this position forced upon us, or again commit our folly of the past half century?

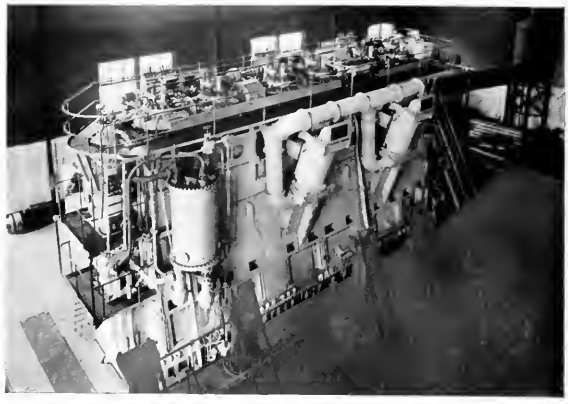
We have but to look back to the days before the World War and there should be no indecision in the answer.

BETHLEHEM STEEL'S NEW OIL ENGINE---II

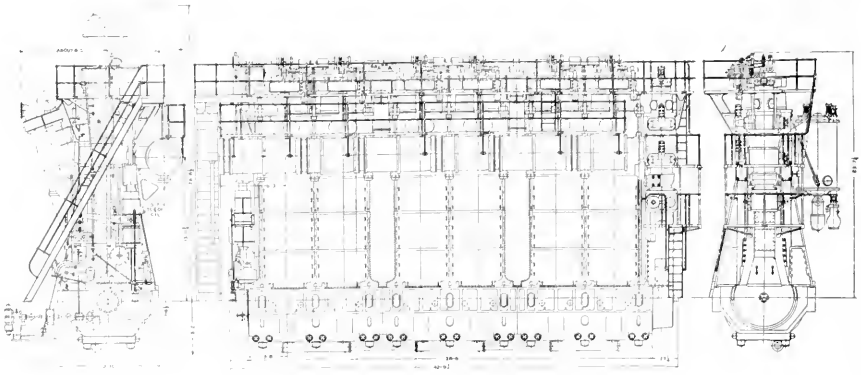
Setting Forth Many Important Features of Design in This New Two-Cycle Oil Engine, Which Has Passed the Experimental Stage and is Now a Demonstrated Success in Both Land and Marine Service

By THE TECHNICAL DEPARTMENT, BETHLEHEM STEEL COMPANY

IN selecting power units for ships, the ease and flexibility of maneuvering with the main engine should be given careful consideration. The Bethlehem oil engine is especially adapted to meet these requirements, due primarily to the simplicity of the reversing gear, to the fuel valve lift control, and to the fact that fuel can be injected into the cylinders without having to shut off the starting air. This last advantage is of particular importance because the engine remains turning over with air until combustion takes place in a sufficient number of cylinders. The reversing gear is simple because there is only one cam shaft. The same set of cams is used for both ahead and astern operations, the camshaft being turned by an air operated revesing gear for the proper timing of the valves in either direction. Reversal from full ahead to full astern may be accomplished in from ten to fifteen seconds, while positiveness and reliability have been proved under actual operating conditions. The reversing gear and gauge board are well shown in Fig. K. The left-hand lever admits starting air to all power cylinders, all of which receive fuel injection simultaneously. When combustion takes place the further ingress of starting air is automatically prevented. The middle lever controls the amount of fuel injected into cylinders and works in a double slot somewhat similar to the selective gear lever on an automobile. The lever is shown in the left-hand slot, in which case it supplies fuel for operation ahead, the amount of fuel being increased by pushing the lever further from the operator. When the operator wishes to reverse he pulls the fuel lever toward him as far as he can. This shuts all fuel off the engine. He then moves the lever to his right as far as possible. This, by means of the valves shown, admits compressed air into an operating cylinder which rotates the camshaft so as to bring the cams into the proper astern position, in which position the gear is automatically locked. When the gear has moved into its extreme position, the lever may be pushed out into the right-hand slot, but the operator is prevented from doing this until air interlocking device is moved out of the path of the lever by the action of the reverse gear completely reaching the end of its travel. The fuel lever is moved out into the astern slot far enough to give the desired power and the engine then goes astern when the operator moves the



Forward port quarter of the new Bethlehem Steel diesel set up on test floor at South Bethlehem



End and side elevations of the new Bethlehem diesel

left-hand air lever away from him. It will be seen that this reversing gear is absolutely fool-proof for the following reasons: first, engine cannot be reversed without first entirely shutting off the fuel; second, engine cannot be given fuel in reverse direction until reverse gear has completely moved into the proper position. It will be seen that no matter how excited the operator may become in any emergency, he cannot possibly go wrong. The right-hand lever determines the lift of fuel valve so as to properly control the injection air at all speeds and powers, as previously explained. This arrangement has the additional advantage that the engine can, in case of emergency, be started without the necessity of charging the injection air bottles beforehand.

Scavenging Compressors

The scavenging compressors are arranged on an incline, and are driven from main connecting rods, as well shown in Fig. B. The scavenging pistons are very light, being made of an aluminum alloy. The scavenging piston rods are very light, being hollow. Due to the lightness, the scavenging piston bears very lightly on the lower side of cylinder wall. After fifteen months' continuous operation it is impossible to detect any more evidence of wear on lower side of scavenging cylinder than on the upper side. Since the total forces due to one scavenging compressor are less than 2 per cent of those passing through the main connecting rod by which compressor is driven, it is evident that no more wear will be found on this main crank pin than on the others. Fifteen months' operation have actually proved this to be the case. This inclined scavenging compressor drive has been proved by long continued hard service to be actually an unqualified success. Its advantages are manifest. It does not lengthen the main engine an inch, and still more important, it does not increase the number of crankshaft bearings which must be kept in line. This detail is especially important on a ship. This arrangement of scavenging compressors also does not take up any floor space whatever, does not increase the height of the engine, and does not materially increase the weight of the engine. These points are all very important on a ship.

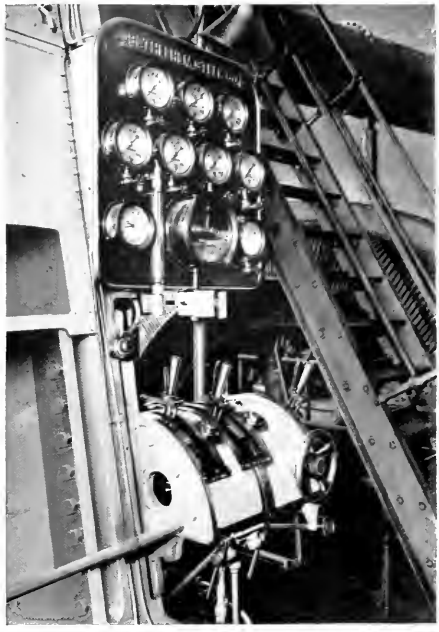
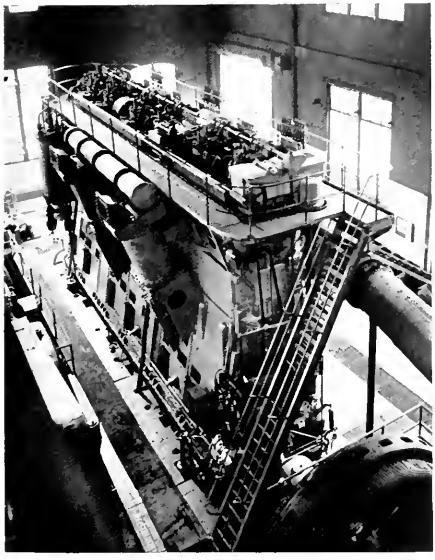


Fig. K.—Control stand of the Bethlehem diesel engine



After port quarter of the new Bethlehem diesel engine as set up on the test floor

Unit Design

The general design of the engine is based upon the unit system, each consisting of two power cylinders, cylinder support, A frames, bed-plate section and crankshaft section. This enables the engine to be built as a 2, 4, 6 or 8 cylinder motor by combining these units. The crankshaft sections are interchangeable, each consisting of two cranks set 180 degrees apart together with flanges on each end, forming an integral part of shaft. The timing of cranks needed for different combination of cylinders is obtained by the manner in which the shaft sections are bolted together. The construction of the section with the cranks opposite has two advantages: first, the inertia forces of the reciprocating parts attached to these cranks are, except for the angularity of the connecting rod, equal and opposite. The vertical planes in which these opposing and counterbalancing forces act are closer together than is possible with any other crank arrangement. The comparative closeness of these planes of action therefore keeps down to a minimum the tendency in a ship to produce periodic vibration. The Cubore, having a 6-cylinder engine, is for this reason

remarkably free from such vibration. The second advantage in constructing a shaft section with two opposite cranks is very important from a practical point of view. The whole crankshaft section is in one plane, from which it results that on a 6 or 8 cylinder engine a center section of crankshaft can be removed endwise without disturbing either the other crankshaft sections or any part of the A frames. It is evident that a shaft section consisting of only two cranks 180 degrees apart is very much easier to handle in cramped quarters than a section consisting of three cranks set 120 degrees apart, this latter being a common construction adopted by other builders. As previously described, the injection air compressor is driven from the forward end of the engine. To preserve the interchangeability of crankshaft sections, tht small crank driving the injection compressor is bolted to the forward flanges of the forward section.

Advantages of Oil Engine Operation

The modern oil engine, considered as a large unit power producer, has so many advantages in its operation that it is rapidly becoming the main source of power in many new installations, and also even supplanting other types of power units in existing installations.

The predominant feature, causing its rapid adoption, is the high degree of economy obtained. Generally speaking, the oil engine consumes one-third the amount of fuel it takes to operate a steam plant of equal horsepower. Absence of boilers, boiler room force, coal and smoke are other factors influencing the adoption of oil engine power.

The elimination of standby losses, and the ease and rapidity of starting, particularly fit the oil engine for intermittent service requirements.

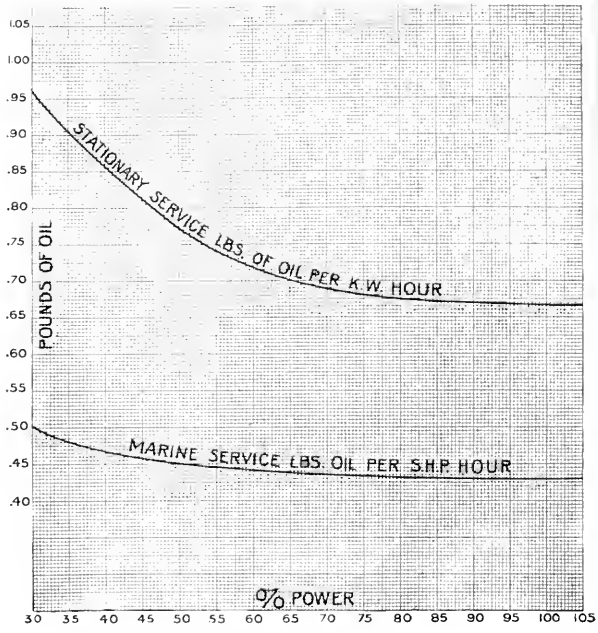
Economy of fuel gives further advantages to the marine installation. Weight being an important factor on board ship, the smaller quantity of fuel oil required for the same operating radius as a steamship of equal power permits a greater amount of deadweight cargo to be carried. Hence, under normal and similar conditions, larger revenues may be obtained from a motorship than from a steamship of equal size.

Test by Endurance Run

To prove the reliability of our oil engine, a thirty-day continuous endurance run was made with the 6-cylinder engine now being regularly used to generate alternating current for steel mill service in our Bethlehem plant. The engine functioned perfectly, and at the end of the run was thoroughly inspected and found to be in excellent condition. The following data gives the average results of the tests:

1.	Duration	730 hrs., 35 mins.
2.	Total revolutions	5,057,997
3.	Average r. p. m.	115.3
4.	Total kilowatt hours produced	1,211,900
5.	Average kilowatt load	1,659
6.	Average b. h. p.	2,522
7.	Average i. h. p.	3,582
8.	Average mechanical efficiency	70.4%
9.	Total pounds fuel oil consumed	849,829
10.	Average pounds fuel oil per kw. hour	0.70
11.	Average pounds fuel oil per b. h. p. hour	0.46
12.	Total gallons bearing oil consumed	716.0
13.	Total gallons cylinder oil consumed	189.5
14.	Total pounds cup grease consumed	158.5
15.	Average gallons bearing oil per hour	0.98
16.	Average gallons cylinder oil per hour	0.25
17.	Average total gals. lubricating oil per hour	1.23
18.	Equivalent sea mileage of total revolutions	8,700

Note: Ordinary plant fuel oil was used, varying from 22 to 36 degrees Baume with high sulphur content.



Power and fuel consumption curves for the Bethlehem diesel engine

Ratings of Bethlehem Oil Engines

The ratings of the Bethlehem oil engine are given in the table below. These ratings are conservative and are based on operation of the engine in severe, continuous service.

	Stationary or Twin-Screw Marine Service			Single-Screw Marine Service	
Number of Cylinders	Revolutions per Minute	Brake Horse Power	Kilowatts	Revolutions per Minute	Brake Horse Power
4	116	1950	1300	90	1600
6	116	2900	1950	90	2400
8	116	3900	2600	90	3200

REMINISCENCES OF OLD TOWBOAT DAYS

By SEA FLAME

AWAY back in the late 80's, the writer was chief of the tug S. L. Mastick, then plying on Puget Sound. To the men of today, familiar with triple-expansion engines, electric lights, wireless, oil burning, refrigeration, towing engines, etc., on seagoing tugs, the power plant and its auxiliaries on the old Mastick would look queer. Thirty-six years has made a great difference in everything pertaining to steamships and tugboats. But the Mastick was a somewhat queerly engined craft, even for those days.

She had two boilers, of the saw-mill type, set in brickwork, using run-of-mine coal for fuel. Sometimes we had to fall back on slab-wood, if the Seattle coal bunkers were too far away and our bunkers were empty. Fortunately the boilers were plenty large, and she steamed easily as a rule. The engines were 20-inch—40-inch x 30-inch, I believe.

Tandem Compound

Her main engines were compound, with the high pressure top of the low, with no glands outside, but a sort of metallic packing in the cover of the low, which was also the bottom of the high pressure cylinder. Obviously this did not get much attention, as the high pressure cylinder had to be removed to get at it. There were two slide valves actuated by the regular link gear. She had a steam reverse engine of the ram type, but had no balancing cylinder, so that great care was necessary in handling, or the links would go over with a "whang" that would shake the boat from stem to stern. She had one old simplex horizontal Knowles pump, used for boiler feed, washing decks, fire hose, etc. That was the extent of the auxiliaries, if a small single cylinder winch, used to haul in the towing hawser, be excepted.

Well, the old girl was heavy in her hull, and the tons of brick around the boilers, with a very massive engine frame, gave her weight, and she could pull well, dragging along one of the old coal ships down the Straits at a six-knot gait. Not so fast, as modern boats go, but at that time thought pretty fair.

Engine Room Aroma

The circulating air, feed and bilge pumps were operated by a single bladed beam, attached to the after side of the crosshead. Her surface condenser has cast-iron tube sheets, though the boys of today will hardly believe this. Our lubricating stuff was dog-fish oil, and as a smell producer when hot, could not be beaten. In those days nearly all the lubricant used up North was dog-fish oil, and the engine room force carried an aroma with them that indicated their calling.

When I joined her I found that the joint at the bottom of the high pressure cylinder was blowing badly, making a great row when the engine was running. The previous engineers had a lot of old sacks tied around to deaden the sound, but it was an awful nuisance anyway. Old Captain Gilmour, the owner, said that they were intending to lay her up soon to have the joint remade, but towing was brisk just then and he wanted her to go. The late Captain Frank Worth was in command, and he was one of the finest men the writer has ever been with.

We took the ship Richard III in tow, coal laden for San Francisco, and started off to Cape Flattery. The leaky joint was snorting and blowing, but we plugged along O. K. May mention here that there were only two engineers then on boats of that class, six hour watches being the rule. There were three firemen, however, as stoking and ash hoisting by hand, would have killed two men mighty pronto.

A Pea Soup Fog

We arrived off the Cape about dusk of the second day, with a stiff nor'wester blowing; got the Richard III out where she could make a fair wind of it, and let go, steaming into Neah Bay to anchor and await an incoming ship for up-Sound. The next morning it was flat calm, with a pea-soup fog over everything. Captain Worth prophesied that this weather would last, and said that we would not move from the anchorage. I then decided to fix the leaky joint.

Lying in the bay was the Revenue Cutter Richard Rush, and I went on board her and borrowed a one-ton tackle and a couple of screw jacks, came back with the stuff, and started on the job. The mate and his two deck hands helped us to rig a spud pole, to which the tackle was fastened. Then with the two jacks under the slide valve chest, we were ready for a lift. There was little or no motion to the boat, as the bay was calm with the exception of a slight "heave" of a ground swell at intervals. So when all nuts were off we made the lift,—just raised her enough to get the joint cleaned, and to put in a dovetailed gasket. Then we lowered away, made up the joint nuts, and cleared up, returning the borrowed gear. The job was finished about three in the afternoon. The fog then lifted and we steamed out, and by a run of good luck picked up the old ship Pactolus, bound for Tacoma. Had a good run back to that port and then went to Seattle for coal.

A Rise and a Raise

When we came alongside the wharf the owner, Captain Gilmour, noticed that the blowing from the joint had stopped. He hailed Captain Worth and inquired "how come?" Was told that the new engineers had made the repairs. When fast to the wharf Gilmour came on board. The chief at the time was below attending to something, and did not meet Gilmour until he came up the engine room ladder. He asked me how and where I did the job, and the story was told him. He was a typical Hibernian, of the old school, and looking at me said, "What wages are ye getting here?" "One hundred and twenty-five per," was the answer. "You're a damned liar," he shot back, "you're getting one hundred and fifty, same as Captain Worth, and will have a share in earnings above a certain amount." I could not afford to get mad at the way the old chap put the raise to me, and stayed in the job quite a while, as at that time one hundred and fifty per month was good pay. The chiefs of of the "liners" only got that in those days.

The old S. L. Mastick is gone; Captains Worth and Gilmour have shipped for the never-ending voyage, and the writer has given up the sea, but likes to look back on the old days, which, while rough and ready, were filled with adventure and hard work, broken at times by fun ashore. We worked hard, and played hard. All the Sound towns were wide open, and faro, roulette, poker, etc., ran full blast. Sometimes a fireman would come down aboard with several hundreds in winnings, and then again the boys would work for months with only their grub and a suit of overalls to show for it. Seattle then was not much more than a logging town, and Tacoma had not emerged from her woods. Both are now metropolitan. Such is the march of time!

THE CHARTER PARTY

Legal Correspondence

THE problems confronting the shipowner of today are more diversified due to greater competition and the increase in tonnage, yet the shipping industry now is governed by the same fundamental commercial practices as existed years ago. Naturally the shipowner is concerned where remunerative employment can be found for his vessel, and he looks to the chartering market for protective business. This market reflects in the highest degree the law of supply and demand. An abundance of tonnage offered will tend to lower the rates within a very short space of time, and likewise an over-supply of cargo with few ships offering will increase the rates. The shipowner must, therefore, keep the conditions constantly before him and decide whether it is to his interests to charter his vessel for business over a short or a long period.

When the vessel is chartered the terms upon which the owner and shipper agree, when reduced to writing, form what is commonly known as a charter party. This document usually covers the entire capacity of the vessel, although vessels are sometimes chartered for part cargoes. This expression is derived from the medieval Latin "carta partita", and is defined as an instrument written in duplicate on a single sheet and then divided by indented edges so that each part fitted the other, whence the term "indenture" now used only for this particular kind of shipping document. Formerly charter parties were made by deed, and records show that in earlier days they were made before notaries, having been prepared by the shipowner's attorney. A modern definition of a charter party is a contract in marine law. As distinguished from a bill of lading, it is a contract of hiring, the bill of lading being a contract of carriage.

The methods of chartering and forms of charter parties vary with the trades and commodities to be carried, but there are three principal forms, namely, voyage charter, time charter, and bare boat charter.

Voyage Charter

In the case of the voyage charter, the owner retains possession and operates his vessel. The charterer merely secures the use of the cargo capacity of the vessel on a particular voyage or series of voyages for the transportation of his own goods or such other goods as he may contract for with other shippers. The charterer is not concerned in the operation of the vessel, but is content with the owner's undertaking that the voyage or voyages will be performed. The charterer only issues instructions to the owner where the cargoes are to be loaded and discharged. Payment for the use of the vessel, known as freight, is based upon the quantity of cargo carried at so much per ton or other cargo unit and is paid either on completion of loading or on completion of discharge, as may be mutually agreed on, less any advances made to the captain at the loading port or disbursements made for the account of the vessel by the charterer at the discharging port when freight is payable on delivery of cargo. Some of the important features in a voyage charter aside from loading and discharging ports, description of cargo, and rate of freight, are described in the following paragraphs:

Readiness and Canceling Dates. The charter party states that lay-days shall not commence before a certain date and should the vessel not be ready to load by a later specified date the charterer has the option of canceling the charter party. These dates should not fall on a Sunday or a holiday.

Lay-Days. The time allowed the charterer for loading and unloading is expressed in days or hours. Sundays and holidays are excepted unless actually used for loading or unloading.

Demurrage. Demurrage is a stipulated sum to be paid by the charterer for delaying the vessel after the lay-time expires. The rate of demurrage is agreed upon in the charter party and is payable even though unavoidable, unless it is occasioned by the ship being unable to sail when loaded on account of embargo or through some act on the part of the owner.

The Ice Clause is inserted in the charter party for the owner's protection. Should the captain find a port inaccessible owing to the ice, or if there is danger of being frozen in, he is directed to communicate as to another port of discharge. Should a vessel be stopped by ice the charterer is required to pay for the time lost by such detention.

The Act of God Clause, also known as "Force Majeure", provides that the owner is not responsible for losses resulting from acts of God, perils of the sea, etc. The meaning of "Act of God" has given rise to much discussion and difference of opinion, but there are two essential features: first, it must have occurred independently of human action, and second, it must have been an event which the shipowner could not have avoided or guarded against by any means which he could be reasonably expected to use. Negligence on the part of the owner's employes is also excepted and usually included in this clause, but negligence is not excepted under American law, although legal under British law. To get over this difficulty, British owners insert a clause to the effect that the charter party or contract shall be governed by the laws of the flag of the vessel.

The Harter Act Clause. The Act of Congress of February 13, 1893, entitled An Act Relating to the Navigation of Vessels and better known as the Harter Act, also defines the liability of the shipowners, and gives the owners protection provided they have used due diligence to make the vessel seaworthy and to perform the obligations imposed on them by the charter party. It is intended only to affect the relations between the shipowner and the shipper. The general policy of the law is that the owner of the vessel must take the care required of experts in that business in all matters relating to the loading, stowage, custody, care and proper delivery of the goods entrusted to him, and must exercise due diligence to make the vessel seaworthy in all particulars which have been used to constitute seaworthiness, and that if these requirements are met entirely neither the vessel nor her owners shall be responsible even for faults or errors in navigation.

The Jason Clause provides that if the owner shall have exercised due diligence to make the vessel seaworthy in all respects it is agrred that in case of damage, danger or disaster the consignees or owners of the cargo shall not be exempt from liability for contribution in general average, but shall contribute with the shipowner in general average. This clause must be included, otherwise charterers or owners of cargo could not be required to contribute under the circumstances mentioned.

Arbitration. Due to the ambiguity of the terms in many charter parties and the different interpretations placed on various clauses, it has been found necessary to embody in the charter party some means of settling the disputes which frequently arise, hence the clause known as the Arbitration Clause. It is stated where the arbitration is to be settled and the method of choosing the arbitrators. For the purpose of enforcing any award made by the arbitrators, it declares that the agreement shall be made a rule of court.

General Average is a loss in the payment of which all benefited contribute, as a result of a voluntary act to prevent a greater loss. For example, when it is necessary to jettison certain cargo to save the ship and/or cargo, all interests benefited must share, making up the loss of the owner of the particular cargo. The vessel, cargo and the freight must each contribute in their proportion to the expenses of the general average. The charter party usually states where the general average is to be adjusted; provides for appointment of adjusters who attend to settlement and collection of average. It also provides for the rules to be followed in making the adjustment. If nothing is stated in the charter party, the owners of the vessel have the appointment of the general average adjuster, and the general average statement will in this event be made up at destination. This is not always to the best interests of the vessel or owners of the cargo, as in many of the smaller ports there are not competent adjusters, nor are the rules of practice or the laws governing these matters at such ports as concise and comprehensive as at larger ports, as New York, London, etc.

Time Charter

The time charter, commonly known as the government form, places the vessel in possession of the charterer, but the owner is required to provide and pay for all wages, provisions and repairs, to provide the captain and crew, and to maintain the vessel in an efficient state of hull and machinery. On the other hand, the charterer agrees to pay a rate of hire based upon the deadweight tonnage of the vessel, and further agrees to pay for fuel, port charges, light and dock dues, canal dues, pilotage, and any agency commissions.

Bare Boat Charter

The bare boat charter is used less frequently than the other two forms. Generally speaking, it is only used where an owner has no organization to look after the operation and upkeep of his vessel. As the term implies, it is a charter of the bare boat. The owner and charterer agree on a rate, usually a fixed amount per calendar month for a definite period, say six months, one year or longer. The charterer accepts the vessel, and not only pays for the hire but takes full possession. It is his obligation to man, supply, repair and maintain the vessel's class. An inventory of all consumable stores is taken before the charter begins and the charterer reimburses the owner for these supplies at agreed prices. Likewise, upon completion of the charter, the owner pays the charterer for supplies remaining on board. It is also customary for an inventory of equipment to be taken, and the charterer agrees to return same in good condition less ordinary wear and tear. The owner in some cases appoints the captain and chief engineer, but they are paid by the charterer. In other cases the entire crew are engaged and paid by the owner.

In time charter and bare boat forms the clauses do not vary greatly from those mentioned under the voyage charter, except as to possession of the vessel and obligations of the charterers and owners.

A charter party may be dissolved by mutual consent or by circumstances which make its fulfillment illegal, such as a declaration of war by the country against that to which she was to go, also by an embargo, blockade, or act of non-intercourse. If the parties knew or expected the circumstances when the charter party was made and provided for them, they can be enforced unless prohibited by law.

When the charter party is executed by both parties, no changes can be made without mutual consent, and if a change is made on the original document it must be initialed or signed by both parties. A better practice, when changes are desired, is to have an addendum drawn up, executed and attached to the original charter party.

In most cases the owner assumes marine insurance, but not war insurance, on the vessel, although there are exceptions to this practice.

Chartering is such a big subject and so many complex questions arise that it is hardly possible to make any fixed rules. The charterer and owner must meet the conditions as they arise. Yet with all the values at stake and the diversified interests involved, it is safe to say that no business is represented by a more honorable or high-minded body of men. By their ability, capital and energy they have done much for the welfare and progress of international commerce.

BREAKS RECORD FOR LONG DISTANCE RADIO BETWEEN SHORE AND SHIP

ALL records were broken for commercial 600 meter continuous wave transmission when Operator M. A. Obradovic, of the steamship West Nilus, while 95 miles north of Wellington, New Zealand, copied a number of messages direct from WIM, the Radio Corporation of America station at Chatham on the Massachusetts coast. The distance is 9300 miles and perfect reception obtained in broad daylight.

Operator M. A. Obradovic, whose reception has been checked and confirmed, sent a letter to Marine Superintendent at Chatham on December 23, in which he reported the history making achievement. The letter, which reads in part as follows, reached the United States more than fifty days after it was mailed in New Zealand:

"Manager Marine Dept.,
RCA,
Chatham, Mass.

Dear Sir:—

Enclosed is one of a number of messages which I have been copying from WIM on 600-meter C. W. The enclosed was copied in broad daylight at 7:10 p. m. New Zealand time, on December 16 (2:40 a. m. your local time), while 95 miles north of Wellington, N. Z., en route from Auckland.

Your C. W. is always strong and clear down here and can hear you any evening when interference is not too heavy. Sigs were especially strong on the 15th.

Yours very truly,

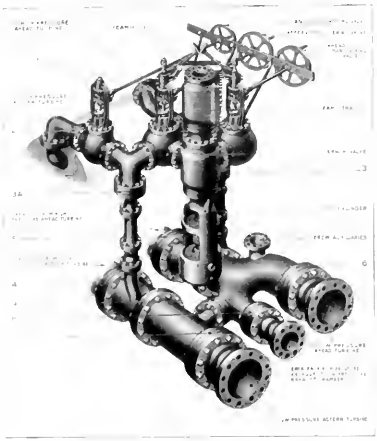
M. A. OBRADOVIC,
Opr. S. S. West Nilus.

Care Struthers & Barry,
Pacific Building, Manila, P. I."

GEARED TURBINE DRIVE

An Interesting Compound Turbine Designed and Built for New Southern Pacific Single Screw Passenger Steamer

THE new passenger and freight steamer being built by the Todd Drydock & Construction Corporation, Tacoma, Washington, for the Southern Pacific Company, which we described in a former issue, will be equipped (like several other recent high-class passenger vessels, such as the Munargo of the Munson Line, the Carabobo of the Red D Line, and the Boston and New York just launched for the Eastern Steamship Company) with geared turbines for propulsion. This type of equipment was selected after thorough investigation by A. S. Hebble, chief superintending engineer of the marine department of the Southern Pacific Company, because when considering reliability and all items of operating cost, such as initial investment, weight, space requirement, fuel cost, and attendance, the geared turbine figured out as the most desirable type of propelling unit.

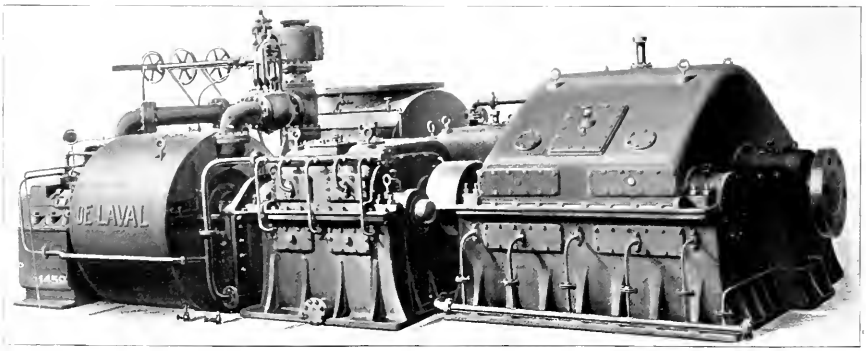


Maneuvering valve arrangement for De Laval compound turbine to be installed on new Southern Pacific passenger vessel.

The De Laval propelling unit, which is to be installed in the Southern Pacific vessel, will be of the type shown in the accompanying photographs. The turbine is of the compound type, and drives the propeller through double reduction gears; that is, it is divided into independent high pressure and low pressure elements in separate casings, with a pinion coupled to the shaft of each element of the turbine driving one of the two high speed gears. Each of the latter in turn is coupled to a pinion located on diametrically opposite sides of and meshing with a single low speed gear coupled directly to the propeller shaft.

The high pressure ahead turbine contains eight pressure stages and the low pressure ahead turbine six pressure stages. The wheel in the first high pressure stage carries two rows of buckets, with stationary guide vanes in between, permitting the use of a comparatively high pressure drop in the first set of nozzles. The initial steam pressure of 225 pounds gauge with 40 degrees Fahrenheit superheat is confined to the steam chest, which is made of steel. The remaining stages of both the high and the low pressure turbines are of the single impulse type, each compartment of the casing containing one wheel, which carries only one row of buckets. De Laval turbines do not require close clearances, which fact permits of rapid starting, stopping, and maneuvering without fear of internal rubbing. The turbine buckets are forged from monel metal, which has been definitely proved to be the most suitable material for marine service.

The combined ahead turbines are designed for 7100 brake horsepower at 85 revolutions a minute propeller speed and are guaranteed to develop a shaft

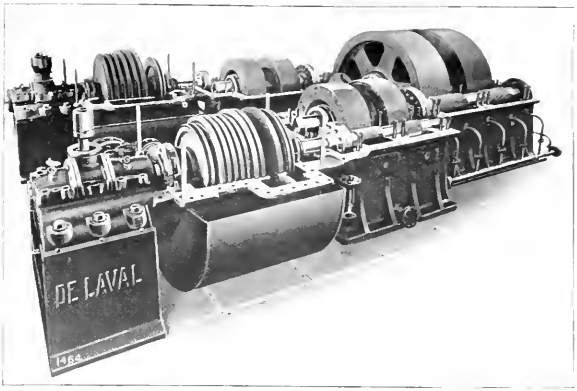


A compound turbine complete with throttle valve control and double reduction gear. This set is similar to that being built for the new Southern Pacific liner

horsepower, including losses in the thrust bearing but not including steam used in auxiliaries, on 10.1 pounds of steam. The piping and control valves, as shown in one of the accompanying illustrations, are so arranged that either the high pressure turbine or the low pressure turbine can be operated alone in emergencies, thus providing a duplicate power plant which will develop sufficient power to drive the vessel at approximately three-fourths of normal full speed.

There are two reversing or astern elements, each consisting of a velocity stage wheel with two rows of buckets, and located in the high and low pressure turbine casings respectively. The power of the reversing turbines is sufficient to take care of any necessary maneuvering. Normally, the reversing elements operate in series; that is, the exhaust from the high pressure reversing element is used in the low pressure reversing element, just as with the ahead turbine. In ordinary ahead operation the reversing elements run idle in the full vacuum produced by the condenser, which is designed for 28 inches mercury with 30 inches barometer. Once the vessel is fairly under way and the need for quick maneuvering no longer exists, the possibility of steam leaking through the reversing throttle valve is eliminated by closing an auxiliary guarding valve located in the astern throttle valve connection. An interlocking gear prevents the opening of both ahead and astern throttle valves at the same time.

An automatic safety speed-regulating governor is provided on each turbine element to limit the turbine speed, as in the event of racing in heavy seas or breaking of the propeller shaft. These governors are of the oil relay type and operate a piston attached to the spindle of the governor valve, which is located between the steam strainer and the ahead and astern maneuvering valves. These safety governors are set to automatically limit the speed to a definite maximum without entirely cutting off the steam supply.



The De Laval compound steam turbine with double reduction gear. Casing covers removed to show rotors of the turbine and the gears

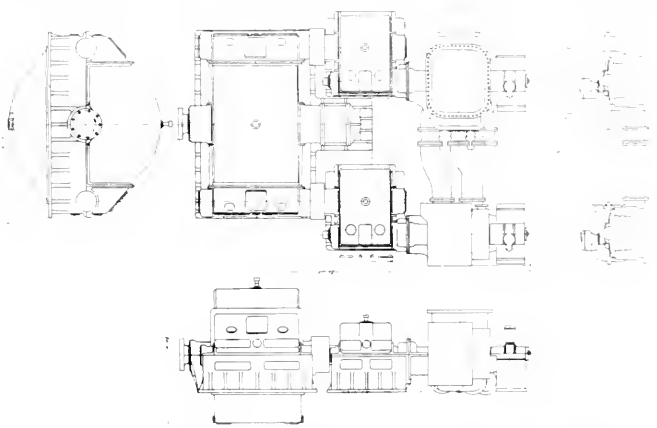
Leakage of steam outward or of air inward along the turbine shafts is prevented by carbon sealing rings contained within bronze housings. Each housing contains four carbon rings of standard construction, with a space between the two middle rings for the introduction of sealing steam to prevent inleakage of air into the low pressure stages. At the high pressure end the steam pressure is first broken down by a metallic labyrinth packing, and similar packings are used where the shaft passes through the diaphragm separating the wheel chambers.

The arrangement of the turbine and gears is shown by the accompanying drawing. The dimensions of the gears are as follows:

Pitch diameter of pinions high speed, inches	—10.2
Pitch diameter of high speed gear, inches	—53.8
Total width working face, inches	—36
Helical angle, degrees	—45
Diametrical pitch	—5
Pitch diameter of pinions low speed, inches	—18.5
Pitch diameter of low speed gear, inches	—128
Total width working face, inches	—60
Helical angle, degrees	—24
Diametrical pitch	—3.3

The gear teeth are cut upon seamless rolled steel bands shrunk upon cast iron centers, while the pinion teeth are cut upon solid nickel steel shafts. As above noted, the helical angle used for the high speed pinion and gear is greater than that of the low speed pinion and gear in order to provide smoother and more quiet opera-

(Continued on page 242)



Diagrammatic sketch showing arrangement of De Laval compound turbines and double reduction gearing on new Southern Pacific passenger steamer

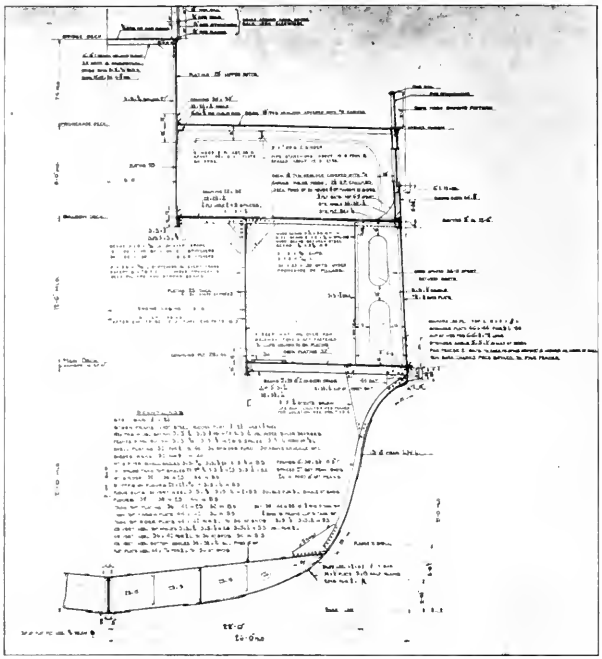
EXPRESS PASSENGER STEAMER CATALINA

By L. E. CAVERLY
Chief Engineer, Los Angeles Shipbuilding & Dry Dock Corporation

THE steamship Catalina, which is being constructed by the Los Angeles Shipbuilding & Drydock Corporation, at Los Angeles Harbor, San Pedro, California, to the order of the Wilmington Transportation Company, is designed for express passenger service between Los Angeles Harbor, California, and Avalon, Catalina Island. The Catalina Islands as well as the Wilmington Transportation Company are owned by William Wrigley, Jr., of Chicago.

The steamship Catalina will be a distinct addition to the present fleet of the Wilmington Transportation Company, which already consists of the steamers Avalon, Cabrillo and Hermosa. The traffic between Los Angeles and Avalon is increasing rapidly and the Catalina will fill a need which has been felt for some time.

The vessels of the Wilmington Transportation Company have their terminus on the mainland at Los Angeles Harbor, and the terminus at Avalon is the company's own pier at that point. The distance from Los Angeles Harbor to Avalon is 25½ nautical miles and the Catalina is designed to make the trip in one and one-half hours.



One-half midship section of new passenger steamer Catalina

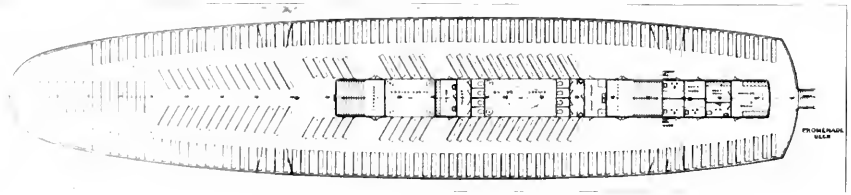
General Description

The Catalina is a steel twin screw passenger steamer, designed for daylight excursion service, with the saloon and promenade decks devoted entirely to passenger accommodations. The greater part of the saloon deck is enclosed in glass and includes a commodious ballroom. Open deck spaces for passengers are provided at the after and forward end of the saloon deck, and the hurricane deck is entirely open. There are ten staterooms on the main deck and four staterooms, including the owner's quarters, on the promenade deck. Large rest rooms are provided on the main, saloon and promenade decks.

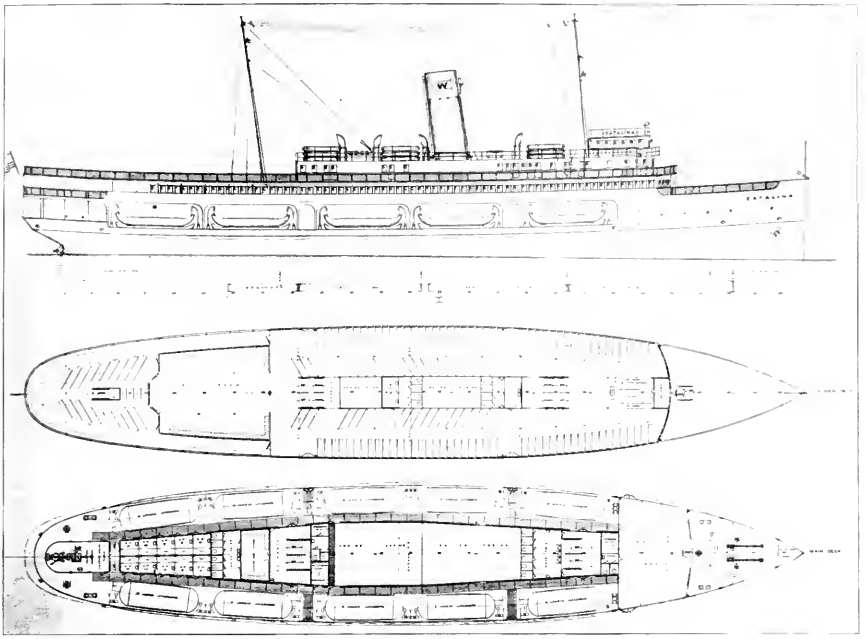
The main propelling machinery consists of two sets of 3-cylinder triple expansion engines. Steam is furnished by a battery of four water-tube boilers operating under forced draft with oil fuel. Fuel oil is carried in part of the double bottom, the remainder of the double bottom, as well as the forward and after peak tanks, being used as ballast or trimming tanks. The vessel is eltctrically lighted throughout and is provided with the most modern sanitary arrangements.

General Dimensions

Length over-all	301′ 7½″
Length b. p.	285′ 0″
Breadth moulded at main deck	52′ 0″
Breadth moulded at 13′ 6″ waterline	44′ 0″
Depth moulded	21′ 0″
Depth of double bottom amidships	3′ 0″
Depth of hold amidships	18′ 0″



The promenade deck of the steamer Catalina, showing outdoor seating arrangement



The new passenger steamer Catalina profile and plans of saloon and main decks

Main to saloon deck	12′ 6″
Saloon to promenade deck	8′ 0″
Promenade to bridge deck	7′ 6″
Draft, mean	13′ 6″
Displacement at 13′ 6″ draft, tons	2390

Hull

The hull is of steel construction throughout with a double bottom extending from the collision bulkhead to the after peak bulkhead. The double bottom is subdivided for carrying fuel oil and water ballast, and both forward and after peaks may be used for ballast or as trimming tanks. There are six transverse watertight bulkheads extending up to the main deck. Steel topsides are provided up to the height of the saloon deck and there is a steel deck house between the main and saloon decks enclosing the engine and boiler casings, entrances, lavatories, staterooms, and steering gear compartment.

The main deck is completely plated over and the saloon deck is constructed of steel stringers and tie plates on steel beams, which alternate with wood carlines. A steel casing enclosing the engine and boiler room casings, lavatories and entrances extends from the saloon deck to the bridge deck, this casing being extended forward on the promenade deck to enclose the owner's quarters, radio room, and forward staterooms.

Main Deck

A large baggage space is provided forward on the main deck with double-hinged cargo ports on both port and starboard sides. These ports are of sufficient size to permit the carrying of automobiles. There are two passenger gangways on each side of the main deck. These gangways are provided wilth double-hinged doors in the bulwarks. There are two large passenger entrances on the main deck, with wide stairways leading to the saloon deck. There is also an emergency stairway between the main and saloon decks near the after end of the vessel.

Saloon Deck

There is a large deck house on the saloon deck, extending from side to side of the vessel. The sides and ends of this deck house are composed entirely of plate glass windows of the drop type, this arrangement making it possible to have the entire deck open, if desired, or partially closed to suit the occasion. There are two passenger gangways on each side of the saloon deck which will be reached from raised platforms on the company's piers. A caulked deck is provided on the saloon deck forward of the deck house, the remainder of the deck being a tongue and groove hemlock deck covered with canvas, except in way of the ballroom, where the floor will be covered with battleship linoleum.

The ballroom, which is located aft on the saloon deck, is of similar construction to the remainder of the house on this deck, the sides and after end consisting entirely of drop windows. Settees, upholstered in velour and with mahogany trim, are provided along the sides and forward end of the ballroom, and there is a musicians' platform in the alcove at the after end. An open archway is provided between the ballroom and the remainder of the saloon deck cabin.

A refreshment counter and storeroom are provided at the forward end of the saloon deck house. There are two labatories on this deck and two wide stairways leading up to the premenade deck. Slatted oak seats are provided inside the deck house on the saloon deck and on the open space aft of the bridge deck.

Promenade Deck

The promenade deck is of tongue and groove hemlock covered with canvas and is entirely open with the exception of the spaces enclosed by the extension of the engine and boiler casings, and of the deck house forward which contains the owner's quarters, radio room, and staterooms. Slatted oak seats are provided on this deck similar to those on the saloon deck. A wooden deck house forward on the bridge deck contains the pilot house and captain's room; and a wide navigating bridge entends from side to side of the vessel at the level of the bridge deck.

The interior finish throughout is of spruce with the exception of the passenger entrances, which will be panelled in Vehisote, and the owner's quarters on the promenade deck, which will be finished in mahogany. All doors, stairways, berth fronts, seats, and furniture will be of oak.

Life Saving Equipment

The most unique feature in the design of the Catalina lies in the location and arrangement of the life boats. In order to provide the most suitable seating arrangement on the saloon and promenade decks, and also to obtain a location for the life boats which would permit of their being handled promptly and efficiently, the life boats are stowed on each side of the main deck, inside of a low steel bulwark.

Twenty Lundin life boats are provided, each having a capacity of 76 persons. These life boats are nested two high and are stowed under ten sets of special Welin davits. These davits have been specially designed to suit the construction and arrangement of this vessel. The boat falls are of wire rope and will be handled by hand operated winches located on the main deck.

In addition to the life boats there are three nests of life rafts located on the bridge deck. Life preservers are stowed in boxes located under the seats on both the saloon and promenade decks.

Deck Machinery

An 8 by 10-inch steam anchor windlass is provided for handling the anchors. The windlass is of heavy construction and is fitted with warping heads for handling head lines. There are 8 by 8-inch steam capstans aft on the main deck and one similar capstan forward on the main deck.

The steering engine is of the right and left hand screw type, and is located in a separate compartment aft on the main deck, where it is directly connected to the rudder stock. The steering engine is controlled through a messenger shaft from the pilot house.

Main Engines

The main power plant consists of two sets of 3-cylinder triple expansion engines, having cylinders 20½, 35 and 60 inches in diameter by a common stroke of 36 inches. These engines are designed to develop 3600 i. h. p. at 100 r. p. m. Both engines turn outboard driving right and left hand propellers. These engines have double crosshead guides and are fitted with piston valves throughout. Steam turning and reversing gear is also provided.

There are four water-tube boilers of Babcock & Wilcox manufacture, having a total heating surface of 13,628 square feet, the boiler room being arranged with a fore and aft fireroom. These boilers operate under a working pressure of 225 pounds and are fitted with Babcock & Wilcox oil burning fronts and burners, Cuyama units. There is an independent motor-driven forced-draft blower located back of each boiler, arranged to draw air from the fireroom and to deliver same through the boiler seating into the front end of the fire box.

Auxiliaries

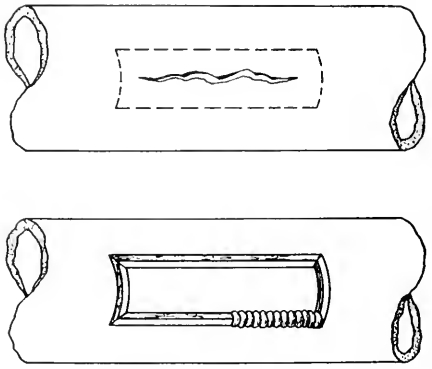
There are two independent condensers, each of 2400 square feet cooling surface, each condenser being provided with an independent centrifugal circulating pump having 12-inch suction and discharge and direct connected to an 8 by 8-inch steam engine. Each condenser also has one independent vertical simplex double acting air pump 10 by 20 by 16 inches. There are also two independent feed pumus, one sanitary pump, one engine room bilge pump, and one fresh water pump of the vertical simplex type. The ballast pump, fire and bilge pumps, and oil transfer pump are of the vertical duplex type.

Electrical Installation

Two 40 kilowatt and direct-connected Engberg steam generator sets provide power for lighting the ship throughout and also for operating forced-draft blowers, machine shop equipment, searchlights, radio, and a few electric cooking devices. These generators are to be located on the level of the main deck in the after end of the engine room casing.

REPAIRING A RUPTURED PIPE BY OXYACETYLENE WELDING

A RUPTURED or broken pipe in the power system of a vessel is often the cause of shutdown and serious voyage or delivery delays. Hence it is advisale to be prepared for such emergencies by understanding how to handle such a repair and have the necessary equipment at hand when it does happen.



Diagrammatic sketch showing method of repairing pipe by oxyacetylene welding

If the break is a longitudinal rupture, as is usually the case, it may be repaired as follows:

With an oxy-acetylene cutting blowpipe cut away the ruptured and weakened metal, leaving a rectangular hole in the pipe as indicated by dotted line in first sketch. Then a rectangular patch of the same thickness and form may be obtained by cutting it from a stock or scrap length of the same size and class of pipe, or it may be readily formed from a piece of sheet steel of the same thickness as the pipe wall. If this thickness is one-eighth inch or more the edges of both the hole and the patch should be beveled to a 45-degree angle with the cutting blowpipe so that when the piece is inserted a 90-degree vee will be formed, thus permitting the welder to obtain full penetration of the joint when he butt welds the patch in place.

MARINE OIL ENGINE AND MOTORSHIP PROGRESS

RECENT MOTORSHIP DEVELOPMENTS

ACCORDING to Lloyd's shipbuilding returns for the quarter ending December 31, 1923, the tide of shipbuilding has turned definitely in favor of the motorship. Considering the total tonnage under construction, steamers have shown a decrease of 32 per cent during the year and motorships an increase of 120 per cent. When we consider the fact that motorships represent only a little more than 3 per cent of the total, these figures are very striking. The graph reproduced herewith shows the trend of steamship and motorship construction by three-month periods for the past four years.

There has been a great revival of motorship building in Germany, which country stands second on the list, with 135,961 tons of motorships under construction as against 323,641 tons for British yards.

Perhaps the most significant fact revealed by the figures for the quarter is that without any doubt oil engines are now considered suitable for the largest vessels required. Of the six liners between 20,000 and 25,000 tons gross now being actively built, three are to be motorships. There is only one liner larger than 25,000 gross tons under construction at the present time, and work on that vessel has been suspended indefinitely.

New German Gearing

We are now able to give our readers the details of the hydraulic gearing for diesel engines, which has been developed by the Vulcan Works at Hamburg and to which reference has been made in these columns at various times.

The gearing, designed by Dr. Fottinger in collaboration with the technical staff of the Vulcan Works, is a combination of hydraulic clutches and mechanical gearing whereby one or more pairs of light-weight high-speed non-reversible diesels are connected up to a single propeller shaft. The gearing consists of one ahead and one astern hydraulic coupling, in each of which there are two impellers, the primary impeller being connected to the diesel engine shaft and the secondary impeller to the pinion shaft of the mechanical gear. In the astern coupling a guide wheel is fitted between the primary and the secondary impellers to change the direction of flow of the hydraulic fluid and so change the direction of rotation of the pinion.

The first installation of this gearing is to be put in a 2000-ton cargo vessel and is to be driven by two 6-cylinder non-reversible submarine engines of 310 brake horsepower running at 300 revolutions a minute, the propeller shaft turning at 85. It will be readily seen that such a hydraulic coupling arrangement is very flexible, absorbs all torsional shock and lends itself to standardized manufacturing methods. The engine room layout can be readily designed for 28,000 brake horsepower with eight engines working on two shafts, the entire arrangement coming down to very reasonable rates and occupying considerably less room than would boilers and geared turbines. Machinery for a cargo and passenger motorship of 4000 brake horsepower and 9500 tons deadweight figures to weigh 717 tons with the diesel engines running at 225 revolutions per minute and the propeller shaft at 85. It is claimed that these figures will show a gain of over 400 tons in weight as compared with 4-cycle direct-connected single-acting engines at 105 revolutions per minute, and the cost will be reduced by over 20 per cent.

Pacific Motorships

Four motorships now being completed at the yard of William Doxford & Son, Sunderland, England, will be of great interest to Pacific Coast readers. These ships are being built for Furness, Withy & Company and are to be used in the direct run between Pacific Coast and Great Britain. The first two vessels, the Pacific Shipper and Pacific Trader, are rapidly nearing completion. These vessels will be 10,000 tons deadweight capacity, will have a speed of 12 knots, with the 4-cylinder opposed piston Doxford engines of 2900 brake horsepower at 87 revolutions per minute.

It is intended to run these engines on boiler oil or Mexican fuel oil of about .95 specific gravity. This oil will be heated by steam coils in the ordinary manner and passed through a Sharples supercentrifuge, which is capable of dealing with 150 to 200 gallons per hour. From the centrifugal machine the fuel will pass over a weighing machine to the daily service tank, and from there will be delivered to the fuel pumps. Duplicate centrifugals will be fitted and spare bowls carried, so that the engineer coming off duty may leave the machine cleaned for the next watch, one machine being used solely for standby purposes. The system is arranged so that these machines can be alternately used for the purpose of purifying of lubricating oil.

Experiments have shown that about 50 per cent of the ash content as well as water and any solid matter held in suspension can be eliminated by use of the centrifugals, and it is hoped by their use to be able to use boiler oil continuously with no harmful effects on the cylinder liners.

Another novel feature in these ships is the installation of a deaerating plant for cooling water, fresh water being used through all pistons and cylinders.

All of these vessels are to have considerable refrigeration space under the new cooled air circulation system, and it is anticipated there will be active demand for this service from California fruit growers.

The vessels are to carry a number of supernumerary engineers in training for service on future motorships contemplated by Furness, Withy & Company.

Sulzer Motors for Large Liner

The Netherlands Steamship Company has recently arranged for building of a 14,000-ton gross passenger liner at Ateliers et Chantiers de la Loire, St. Nazaire. This vessel will have an over-all length of 540 feet and will be powered with two 8-cylinder 2-cycle Sulzer motors developing 4000 brake horsepower each at 100 revolutions per minute. These are said to be the most powerful single acting marine engines contracted for up to the present time.

HITTING ON ALL SIX

The Single Screw Motorship Seekonk, Converted by William Cramp & Sons Ship & Engine Building Company from a Hog Island Steamer, Makes Splendid Record on Her First Run

THE motorship Seekonk on February 6 completed her first voyage to the Pacific Coast and return, having left New York on November 12 for Baltimore, where she started her loading. During the entire voyage there were no involuntary stops or delays on account of the machinery.

The results of the voyage are given on the acompanying data sheet. The mean sea speed was 10.29 knots, or three-tenths of a knot in excess of the guaranteed speed. The usual amount of rough weather was encountered that may be expected at this time of the year, and as evidenced by two days' runs, when, due to heavy head sea and gales, the speed fell to less than seven knots for the twenty-four hours.

Although on the outward trip the vessel was lightly loaded, it had the disadvantage of a six-foot drag, with the propeller one foot out of water.

On the return trip, when fairly well loaded, from San Pedro to the canal, with weather conditions fairly good, the mean speed was 10.36 knots, with the mean fuel consumption 7.42 tons per day for main and auxiliary engines, the donkey boiler not being in use. For this run the main engine developed on an average 2259 i. h. p. at 85.01 r. p. m., with a mean indicated pressure of 6.25 KgCm, in the cylinders, which is the designed working pressure.

Westinghouse electric cargo winches handling Pacific Coast lumber at an Atlantic Coast terminal from the motorship Seekonk, fuel cost .3 of a cent per ton handled.

For three days of this run, January 17 to 20, the sea conditions were good, with revolutions per minute of propeller not varying two-tenths of a revolution for the day's average. The mean of the three days is as follows:

Speed by observation, knots	10.66
Revolutions per minute	86.1
Slip, per cent	5.3
Fuel per 24 hours, main and aux. engs., tons	7.43
M. I. P. main engine KgCm	6.26
M. I. P. auxiliary engine KgCm2	4.97
I. H. P. main engine	2285
I. H. P. auxiliary engine	120
I. H. P. main and aux. engs.	2405
Pounds oil per I. H. P. main engine, all purposes	.3035
Pounds oil per I. H. P. main and auxiliary engines, all purposes	.2885

The above economies correspond very closely to those obtained on the builder's trials.

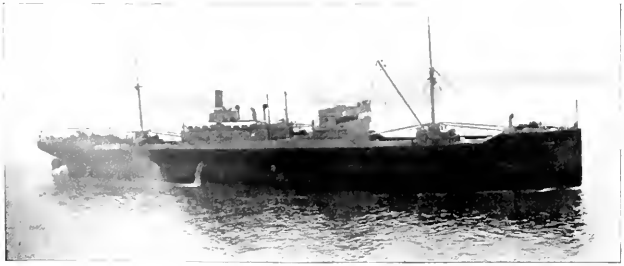
Under the light loaded conditions on outward trip and good weather, and with the designed mean pressure in cylinders, the propeller easily turned 90 r. p. m., corresponding to 11 knots through the water.

For the usual calculations the indicated horsepower of the one auxiliary engine in operation at sea has been taken as at the round figure, 100, the same as on builder's trials, although cards taken on auxiliary engines on the return trip would indicate that the average actually is probably 20 per cent higher. About half the output of the generators, or a total of 40 kilowatts, is consumed for purposes external to the engine room proper, in addition to the electric steering gear and lighting load, there being two electric fresh water heaters for the captain and engineers, electric coffee urns, and hot plates.

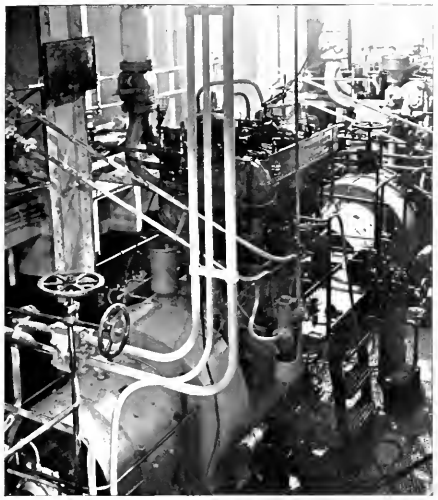
Cards taken on the main engine two days before arriving back in New York indicate an ideal working condition, with the load very evenly divided between the cylinders.

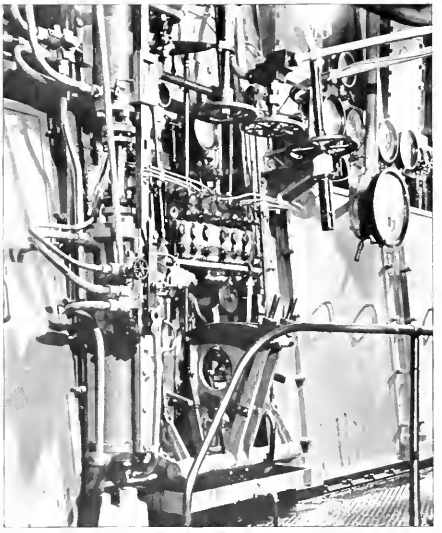
Deck Machinery

There was no trouble experienced with the deck machinery. The Cramp winches with Westinghouse motors worked to the entire satisfaction of the stevedores, one pair of winches in all ports on the Pacific Coast being operated by one man. When handling cargo, with all ten winches in operation for eight hours per day, the total consumption of fuel oil for auxiliary engines for the twenty-four hours was .42 ton. At $1 per barrel, paid for oil under contract on



The motorship Seekonk on her trials. The Seekonk, a Hog Island steamer, was converted to a diesel-engine motorship at the plant of William Cramp & Sons Ship & Engine Building Co., Philadelphia, by the installation of a Cramp-Burmeister & Wain, long stroke, slow speed, 6 cylinder diesel and by the conversion of all of her auxiliary machinery to electric power. She has made a splendid record for economy and reliability in her intercoastal service.





Views on the motorship Seekonk. Above—Two of the three Cramp-Westinghouse diesel-electric generating sets. At right above—The capstan, formerly steam driven, now arranged for Westinghouse electric drive. At right below—Control stand of the main engine.

Below is shown a reproduction of a summary of the engineer's log for Voyage No. 1:

VOYAGE NO. 1 - MOTORSHIP SEEKONK

(November 16, 1923 to February 6, 1924)

		Nautical Miles
Total Distance, dock to dock		14,022
" " in harbors and rivers		777
" " at sea		13,245
Total Time at sea	50 days, 20 hrs. 2 min.	
" " in harbors and rivers	4 days, 14 hrs. 39 min.	
" " in ports	25 days, 16 hrs. 10 min.	
Mean sea speed		10.29
" I.H.P. Main engine		2252
" I.H.P. Aux. engine		100
Total I.H.P. Main and Aux. Engines		2352
Total Fuel Consumption, Main and Aux. Engines at Sea		786.5 tons
" " " Donkey Boiler at Sea		7.5 "
" " " at Sea		350 "
Fuel Consumption in rivers, harbors, and canal		26.7 "
" " " in port, all purposes		19.7 "
Mean Consumption per day at sea, Main & Aux. Engines		7.51 "
" " " " " in port, all purposes		.70 "
" " " I.H.P. Main & Aux. Engines		.298 "
Miles per Ton of Fuel		32.8

Lubricating Oil Consumption	In Port	at Sea
For general lubrication	26 pts.	110 pts.
" cylinder lubrication	6 "	148 "
" compressor lubrication	40 "	72 "
Total	72 "	330 "
Average per day	2.61 pts.	7.61 pts.

Mean Fuel Consumption of Auxiliaries	Tons per day
Donkey boiler mean in operation	.41
One auxiliary in port, when not handling cargo	.47
When handling cargo (two auxiliary engines in operation from 8 a.m. to 5 P.M. and one auxiliary engine in operation remaining time)	.42

Loading and discharging cargo	
Total cargo handled	9483 tons
Kilowatt hours input to winch motors	9470
Proportion of total fuel consumption, auxiliary engines, for kilowatt input to winch motors	4.1 tons
Kilowatt hours per ton of cargo handled	.676
Pounds of oil per ton of cargo handled	.97

the Pacific Coast, the actual cost of fuel per ton of cargo handled is calculated as three-tenths of a cent.

Compared with the sister ship Hog Island-type having steam drive, it will be seen the Seekonk averages approximately the same sea speed on about one-fourth the amount of fuel oil. In port only one-tenth that taken by the steamers is required for the motorship.

The Seekonk was formerly driven by a geared turbine installation of 3000 horsepower. The only structural change necessary in converting to diesel engine power was the removal of a screen bulkhead between the engine and boiler rooms. Approximately 17,800 cubic feet of cargo space were gained by the change, and, supplied for full cruising radius, the motorship will carry approximately 1000 tons more of freight.

Pacific Marine Review
The National Magazine of Shipping

OUR CREED

We believe in presenting, with Pacific Ocean emphasis, a broad survey of American Merchant Marine activities, to the end that Pacific American marine operating problems may be solved through contact with the best experience of the maritime world.

We strive for conservative accuracy.

We welcome constructive criticism.

We serve the American Merchant Marine.

A. J. DICKIE,
Editor.

Section 28

NEARLY four years after the enactment of the Merchant Marine Act of 1920 it is for the first time planned to put into effect some of the provisions extending preferential aid to American shipping. Announcement was made this week by the Interstate Commerce Commission, following the certification by the Shipping Board that adequate facilities exist under the American flag, that, effective May 20, the suspension of Section 28 of the Act of 1920 would be set aside. The effect will be that where there are export and import rail rates on commodities, these will apply only when the goods are carried by American vessels, grain only excepted.

Strong protest against this action is being made by all Pacific Coast chambers of commerce and by many similar bodies in other parts of the United States. The Pacific American Steamship Owners' Association is not nearly so unanimously in favor as they were two years back.

From the American ship standpoint, Section 28 says to the foreign buyer, "Ship in American ships or pay more for American goods." From the standpoint of the American exporter, Section 28 will make the foreign buyer say, "Give my ships a chance or I'll buy in some other market."

There can be no doubt that Section 28 will have an immediately beneficial effect so far as American shipping is concerned. On the other hand its continued enforcement would certainly have a tendency to drive elsewhere a large body of our most profitable customers.

Section 28 places the Administration at Washington in an embarrassing dilemma. It should either be enforced or repealed. Perhaps the best way to fairly judge its merits would be a good trial at enforcement.

In the meantime Article 8 of the proposed commercial treaty with Germany (a "model" for treaties with other nations) will, if passed, make the enforcement of Section 28 impossible and American shipping will once more be made the scapegoat.

Consolidation

ALMOST coincident with the Shipping Board's declaration that ample shipping facilities existed under the American flag, came the announcement that the plan of Admiral Palmer, president of the Emergency Fleet Corporation, for the consolidation of the board's services between North Atlantic and Scandinavian ports has been approved. This plan will result in the withdrawal of four American ships and two operators. Further consolidations and further withdrawals of ships on other routes are stated to be in course of consummation; and in some cases eliminated operators are expected to take over agencies for foreign lines in the same trades. It is reported that the Board will hold the withdrawn ships as spot tonnage, to be returned to service when needed.

This consolidation plan is certain to effect immediate operating economies. There is, however, much room for speculation as to the ultimate effects on the prosperity of the merchant marine. If, as many shipwise leaders believe, shipping is on the upward trend and will now make a steady progress back to a normal condition, it would certainly seem unwise to withdraw services. If, on the other hand, agencies and operations can be consolidated and still cover all essential services, there is no argument against consolidation.

Admiral Palmer, after careful study, maintains that the proposed consolidations can be effected without any sacrifices of present or future business and without detriment to any present essential services. Let's give the idea a fair trial.

The Great Lakes Waterway

THE project of opening the Great Lakes to ocean-going ships and development of the great power resources of the St. Lawrence River, on behalf of both the Canadian and American people, has been a hope long treasured by many millions of our people and it is in the desire that this matter, if it is sound and practicable, should be

AMERICAN BUREAU SCHOLARSHIP PRIZE

(From the minutes of the annual meeting of the American Bureau of Shipping.)

Be it resolved, That in order to encourage the study of naval architecture and marine engineering in American institutions of learning, the American Bureau of Shipping shall annually present a prize of $100 in gold to the graduate of each and all American institutions where these subjects are taught, who may attain the highest average in scholarship throughout his course of instruction.

American Bureau! Six!!

brought one step nearer to consummation that I am asking you and your fellow commissioners to serve in this matter.

In these words Calvin Coolidge, President, charges a commission appointed on March 14, 1924, to be known as the St. Lawrence Commission and comprising:

Herbert Hoover, Secretary of Commerce, chairman.

William C. Breed, attorney-at-law, New York City, former president, New York Merchants' Association.

James E. Davidson, Bay City, Michigan, vice-president, American Ship Building Company, Bay City.

James P. Goodrich, Winchester, Indiana, formerly governor of Indiana.

James R. Howard, Chicago, Illinois, formerly president, American Farm Bureau Federation.

James D. Noonan, American Federation of Labor.

Stephen B. Davis, Washington, D. C., counsel.

Charles P. Craig, Duluth, Minnesota, executive secretary.

A further member of the commission will be chosen from the commercial community in the New England states.

This is a strong commission on a very important job. National attention to the development of the St. Lawrence River has become greatly advanced by the legislation of eighteen states, creating a council known as the Great Lakes-St. Lawrence Tidewater Association, including Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Colorado, Wyoming, Montana, Idaho, Utah, and Oregon, with the governors of the states as members of the council.

The opening of the St. Lawrence route would effect transportation involving nearly forty-two million of American population and make possible the development of 1,500,000 hydro-electric horsepower.

The German Spirit

SINCE the old Hanseatic league days German merchants have been noted for a patient, persistent spirit that permeated all their mechandising methods. This spirit is much in evidence today as Germany is trying to lift herself out of the hole into which she was plunged by her war lords' ambitions. Perhaps the most spectacular instance of this is in the opening up of the old Petrograd-to-Persia route via the St. Mary's canal system, the Volga River, and the Caspian Sea.

In 1922 one 200-ton vessel made the trip from Hamburg to Enzeli in six months. This trip led to the formation of a Russian-German company capitalized at 250,000 gold rubles, and owned one-half by a consortium of German firms and one-half by the Soviet government, which had reserved the right to one-half the cargo space on all vessels and granted certain German firms exclusive privileges on the route.

In 1923 six German vessels, heavily laden with German merchandise, arrived at Enzeli, and recently a new specially designed one-deck motorship of 1100 tons displacement has been completed and placed on the run. This vessel is named Ispahan.

So Hamburg is now in direct water communication with the center of the Asia-European continent.

Teapot Dome

THE so-called "Walsh investigation" into naval oil leases is typical of the senility of our Senate. If such investigations are necessary and official life at Washington is such a mess of corruption as the press headlines indicate, what profit can there be in periodical displays of smut followed by the inevitable coat of whitewash? The secret service operators can get all the evidence in any of these cases and prepare the same up to the point of court procedure without publicity, and then prompt justice can be meted out without interfering with the regular business of Congress.

The reason for publicity is, of course, politics, but taking Tea Pot Dome and the Doheny fracas as critteria, such investigations would seem to be the last word in political foolishness. Still the Senators refuse to learn a lesson, and we are now to have an investigation of the Shipping Board and probably of many other governmental agencies.

We are tempted to transpose an old Scotch story and tell of a Washington parson who preached from the text in the Psalms, "I said in my haste all men are liars." Closing the book carefully, taking off his glasses, and looking long and silently over the congregation, he solemnly remarked, "Deed, David my man, had ye lived in this parish ye micht have said it at your leisure."

The Edmonds Bill

THE most interesting phase of recent developments in American motorship progress is the Edmonds bill.

This bill, as originally introduced by Representative Edmonds, had its first hearing before the Committee on Merchant Marine and Fisheries, and as a result was reintroduced about the first of February in the form of House Resolution 7548 "to amend Sections 11 and 12 of the Merchant Marine Act of 1920."

This resolution was subsequently subjected to a few very minor changes and reintroduced as House Resolution 6202 by Chairman Greene of the Committee on Merchant Marine and Fisheries, that committee agreeing to report the new bill favorably.

As drawn, the bill is not specifically to encourage the motorizing of vessels. The language in this regard has been changed so as to make the construction loan fund available for the equipping of vessels already built with "modern, efficient, and economical appliances" as well as for construction of new tonnage.

This new bill provides that all vessels constructed or equipped with the aid of loans from the construction fund shall remain under American registry until the entire loan is repaid, and in any case not less than

five years after the loan is made. The time limit on loans is fifteen years, the installment interval not to exceed two years. No installment at intervals exceeding one year may be less than 12 per cent of the total. Installments at intervals not exceeding one year should be not less than 6 per cent of the total. During operation in coastwise trade or while the vessel is laid up, interest on the loan shall be not less than 5¼ per cent; during operation in foreign trade not less than 4¼ per cent. The amount of loan is limited to one-half the cost of the vessel to be constructed, or one-half the cost of equipment. If additional security is furnished, loan may be not more than one-half the cost of the vessel or equipment, plus one-half the value of additional security, but in no case more than two-thirds the value of the vessel or equipment.

Section 12 of the Merchant Marine Act at present provides that the Shipping Board may "recondition, operate, and lease all vessels until sold." The new bill provides the addition of a paragraph in Section 12 which would make the word "recondition" cover conversion of steamers to diesel engine drive. Should the funds at the disposal of the Shipping Board be insufficient for such conversion the Board is authorized to make up the deficiency out of the construction loan fund, with the provision that the total amount expended for this purpose shall not exceed twenty-five million dollars.

Vessels so converted shall not be sold for a period of five years after conversion unless the price obtained is equal to the cost of such conversion and any other reconditioning done at the same time, plus not less than ten dollars per deadweight ton for the capacity of the ship as computed before the reconditioning, less depreciation from the completion of the conversion to the date of sale, which depreciation shall not be fixed at more than 5 per cent per annum. The Shipping Board may not convert such vessels unless it shall have made a binding contract for a satisfactory sale of such vessels or for the charter or lease of such vessels for not less than five years, or unless the Board is prepared and intends to put the vessel into operation upon conversion.

Vessels so converted by the Shipping Board shall remain under United States registry for not less than five years from the date of completion of the conversion, and during that five years shall be operated only on routes which are not exclusively coastwise.

Refrigerative Shipping

A GROWTH in demand for refrigerative space is being felt both in the intercoastal and the foreign services from and to Pacific Coast ports. Nearly all modern carriers have some refrigerative space and a number of our intercoastal and offshore freighters are offering capacities for this class of freight up to 1000 tons.

Properly managed, there is no doubt that refrigerative shipments of Pacific Coast fruits and vegetables will ultimately result in a very large tonnage of waterborne freight.

This trade, however, cannot be forced as some speculators seem to think. It is a highly specialized branch of the carrier's business and must be handled with kid gloves. One large shipment spoiled en route or dumped on an overloaded market will set back progress for years. Market prices are more important than freight rates, and many western fruit growers use express shipments at high rates to be sure of hitting the market right.

Rail and water transportation and distribution, storage and packing facilities must be intelligently coordinated. Before this is accomplished there can be only experiments in a comparatively small way. Afterwards the possibilities are practically unlimited.

A Merchant Seaman

CAPTAIN Arthur Henry Rostron, commander of the Cunard liner Mauretania, who as captain of the Carpathia rescued the survivors of the Titanic disaster, for which he was awarded the Congressional medal, has received the highest mark of recognition open to his profession by being appointed a Royal Naval Reserve Aide-de-Camp to the King.

This tying of the merchant marine to the navy has many aspects of value, and the British have worked it to great advantage. Measures now pending in Congress will, if passed, make a commercial and an actual connection between the merchant seamen and the naval seamen of America. There should also be established a coordination of rank between naval officers and merchant ship officers, so that at any time of emergency merchant shipping and merchant seamen would all be automatically lined up in their proper places.

Promotion in rank for merit in peace time sea service would have a great publicity value in impressing the importance of the merchant marine on the mind of the average American citizen.

Industrial Mobilization

OF great interest to shipbuilding and marine engineering firms on the Pacific Coast is the plan of the War Department for industrial mobilization. This plan contemplates peace time planning for possible war activities. Under its provisions the War Department is making a complete survey of the industrial plant of the United States and allotting certain duties to certain plan and certain location.

This scheme includes provision of work to keep alive necessary plant, capitalization to create, and provision of work for maintaining plant where and when considered necessary, and recommendations for allotment of surplus government tools to privately-owned industrial plant. The work is being done quietly and with very little publicity. Shipbuilding executives are asked to cooperate in giving information and advice to the War Department representatives.

DAVID CROCKETT, CLIPPER SHIP

A Brief History of the Celebrated Vessel and Her Forty Years of Hard Service in her San Francisco-New York-Liverpool Run

THE old "Davy" Crockett was one of the longest lived of the famous American clipper fleet, having a career of nearly forty years, during all of which time she was hard driven, and the fact that some of her fastest passages were made after she had passed the quarter century mark is ample evidence of the superiority of her construction.

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Figurehead of the David Crockett, set up on the floor of the San Francisco Merchants Exchange

Dimensions

The David Crockett was launched on October 18, 1853, from the yards of Greenman & Company of Mystic, Connecticut, for the account of Handy & Everett of New York. The builders' measurements were: length, 215:10; breadth of beam, 40:10; depth of hold, 27 feet; tonnage, old style, 1679. Under the new system of measurement her dimensions were given as 218:8 by 41 by 27; 1547 tons. Her capacity for California cargo was 2800, weight and measurement tons; when carrying wheat from San Francisco to Liverpool she was deeply laden with 2200 short tons.

Her model proved to be one of the most successful combinations of speed and cargo capacity, and in this respect connoisseurs of marine matters regarded her as nearly perfect. While heavily sparred, she was not so lofty as some of her clipper competitors, notably Young America, nor was her general appearance quite so handsome, but she was decidedly distinctive. She crossed three skysail yards and through all her Cape Horn passages retained the old style single topsail on the mizzen mast. A noticeable feature was her figurehead, a life-sized carved image of the eccentric backwoodsman-senator after whom she was named. The coon-skin cap and rifle were in evidence and the whole figure as natural as life. This image has recently been presented to the San Francisco Chamber of Commerce by a prominent shipping merchant, and will undoubtedly be one of the most interesting exhibits in their marine department.

A Money Maker

Throughout her career the David Crockett was a phenomenally successful ship and, up to the time of her sale in 1883 is said never to have cost the underwriters one dollar. She also proved a mint to her owners. Her original cost being $93,000, up to 1876 she is said to have returned a net profit of $500,000, including allowance for a thorough overhauling in 1869. In 1866 her freight list from New York to San Francisco was $46,872, gold, while for her return cargo of wheat and barley to Philadelphia she received $30,000 in currency. The total time on round voyage was 234 days, including twenty-six days in port at San Francisco. In 1872-1873 her total time on voyage from New York to San Francisco, thence to Liverpool, was 261 days, of which fifty-five days were spent in port. Her net profit was $37,000 on this trip, and for her grain cargo to Liverpool she received 4 pounds, 2 and sixpence for 2000 pounds. Truly, a first-class clipper, ably commanded and managed, was excellent property in the good old days.

During 1854 the David Crockett was operated in the Handy & Everett line of New York-Liverpool packets. In January, 1855 she left Liverpool for Aden and made the passage out in 85 days. Proceeding thence to Bombay she made the run from that port to Liverpool in 104 days. Being returned to the trans-Atlantic trade she was operated therein for something over a year, during which time her fastest voyage was 19 days from New York to Liverpool and 25 days back to New York. She was then put on the berth for San Francisco, arriving out July 19, 1857, 122 days' passage. Captain Spencer reported being 15 days off Cape Horn in heavy gales, during which time the deck house and everything movable were washed overboard. She crossed the line in the Pacific on June 28, the run thence to port being 21 days, made in the face of strong northerly winds. She sailed from San Francisco October 6 and arrived at New York January 10, 1858, 96 days' passage; anchored on the bar January 9; made the run from the equator to Sandy Hook in 18 days.

Second Voyage

On her second passage from New York to San Francisco, the David Crockett was 19 days to the line; 64 days to Cape Horn; 11 days from 50 to 50, in moderate weather; crossed the equator June 22, 90 days out; had a good run to latitude 39, after which faced strong head winds; arrived at destination July 19, 1858, 117 days out. She sailed from San Francisco

five years after the loan is made. The time limit on loans is fifteen years, the installment interval not to exceed two years. No installment at intervals exceeding one year may be less than 12 per cent of the total. Installments at intervals not exceeding one year should be not less than 6 per cent of the total. During operation in coastwise trade or while the vessel is laid up, interest on the loan shall be not less than 5½ per cent; during operation in foreign trade not less than 4½ per cent. The amount of loan is limited to one-half the cost of the vessel to be constructed, or one-half the cost of equipment. If additional security is furnished, loan may be not more than one-half the cost of the vessel or equipment, plus one-half the value of additional security, but in no case more than two-thirds the value of the vessel or equipment.

Section 12 of the Merchant Marine Act at present provides that the Shipping Board may "recondition, operate, and lease all vessels until sold." The new bill provides the addition of a paragraph in Section 12 which would make the word "recondition" cover conversion of steamers to diesel engine drive. Should the funds at the disposal of the Shipping Board be insufficient for such conversion the Board is authorized to make up the deficiency out of the construction loan fund, with the provision that the total amount expended for this purpose shall not exceed twenty-five million dollars.

Vessels so converted shall not be sold for a period of five years after conversion unless the price obtained is equal to the cost of such conversion and any other reconditioning done at the same time, plus not less than ten dollars per deadweight ton for the capacity of the ship as completed before the reconditioning, less depreciation from the completion of the conversion to the date of sale, which depreciation shall not be fixed at more than 5 per cent per annum. The Shipping Board may not convert such vessels unless it shall have made a binding contract for a satisfactory use of such vessels or for the charter or lease of such vessels for not less than five years, or unless the Board is prepared and intends to put the vessel into operation upon conversion.

Vessels so converted by the Shipping Board shall remain under United States registry for not less than five years from the date of completion of the conversion and during that five years shall be operated only on foreign voyages unless exclusively coastwise.

Refrigerative Shipping

A great demand for refrigerative space is developing in the intercoastal and the foreign trade from Pacific Coast ports. Nearly all owners of refrigerative space and a number of our intercoastal and offshore freighters are offering capacities for this class of freight up to 1000 tons.

Properly managed, there is no doubt that refrigerative shipments of Pacific Coast fruits and vegetables will ultimately result in a very large tonnage of waterborne freight.

This trade, however, cannot be forced as some speculators seem to think. It is a highly specialized branch of the carrier's business and must be handled with kid gloves. One large shipment spoiled en route or dumped on an overloaded market will set back progress for years. Market prices are more important than freight rates, and many western fruit growers use express shipments at high rates to be sure of hitting the market right.

Rail and water transportation and distribution, storage and packing facilities must be intelligently coordinated. Before this is accomplished there can be only experiments in a comparatively small way. Afterwards the possibilities are practically unlimited.

A Merchant Seaman

CAPTAIN Arthur Henry Rostron, commander of the Cunard liner Mauretania, who as captain of the Carpathia rescued the survivors of the Titanic disaster, for which he was awarded the Congressional medal, has received the highest mark of recognition open to his profession by being appointed a Royal Naval Reserve Aide-de-Camp to the King.

This tying of the merchant marine to the navy has many aspects of value, and the British have worked it to great advantage. Measures now pending in Congress will, if passed, make a commercial and an actual connection between the merchant seamen and the naval seamen of America. There should also be established a coordination of rank between naval officers and merchant ship officers, so that at any time of emergency merchant shipping and merchant seamen would all be automatically lined up in their proper places.

Promotion in rank for merit in peace time sea service would have a great publicity value in impressing the importance of the merchant marine on the mind of the average American citizen.

Industrial Mobilization

OF great interest to shipbuilding and marine engineering firms on the Pacific Coast is the plan of the War Department for industrial mobilization. This plan contemplates peace time planning for possible war activities. Under its provisions the War Department is making a complete survey of the industrial plant of the United States and allotting certain duties to certain plant and certain location.

This scheme includes provision of work to keep alive necessary plant, capitalization to create, and provision of work for maintaining plant where and when considered necessary, and recommendations for allotment of surplus government tools to privately-owned industrial plant. The work is being done quietly and with very little publicity. Shipbuilding executives are asked to cooperate in giving information and advice to the War Department representatives.

DAVID CROCKETT, CLIPPER SHIP

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During 1854 the David Crockett was operated in the Handy & Everett line of New York-Liverpool packets. In January, 1855 she left Liverpool for Aden and made the passage out in 85 days. Proceeding thence to Bombay she made the run from that port to Liverpool in 104 days. Being returned to the trans-Atlantic trade she was operated therein for something over a year, during which time her fastest voyage was 19 days from New York to Liverpool and 25 days back to New York. She was then put on the berth for San Francisco, arriving out July 19, 1857, 122 days' passage. Captain Spencer reported being 15 days off Cape Horn in heavy gales, during which time the deck house and everything movable were washed overboard. She crossed the line in the Pacific on June 28, the run thence to port being 21 days, made in the face of strong northerly winds. She sailed from San Francisco October 6 and arrived at New York January 10, 1858, 96 days' passage; anchored on the bar January 9, made the run from the equator to Sandy Hook in 18 days.

Second Voyage

On her second passage from New York to San Francisco, the David Crockett was 19 days to the line; 74 days to Cape Horn; 12 days from 50° to 50°, in moderate weather; crossed the equator June 22, 99 days out; had a good run to latitude 30, after which she had strong head winds; arrived at destination July 19, 1858, 117 days out. She sailed from San Francisco

October 17 and arrived at New York January 15, 1859. some hours under 89 days. She again sailed from New York March 16, 1859, and arrived at San Francisco July 27; Captain Rowland, who had assumed command, reported having had very severe weather throughout the run of 131 days; was 44 days from 37 south, Atlantic, to the same latitude in the Pacific; on June 14, while lying to in a heavy gale, latitude 40 south, Pacific, the vessel shipped a sea which stove the monkey-rail, the doors of the forward deckhouse, and so severely injured the carpenter that he died three days later. Sailed from San Francisco October 15; on December 2, 48 days out, was off the Straits of Le Maire; when 72 days out was about 60 miles north of Pernambuco; arrived at New York January 16, 1860, 93 days from the Golden Gate.

Captain and Business Man

The command of the David Crockett was now given to John A. Burgess of Somerset, Massachusetts, who had been educated at Brown University and had taken up sea life on account of ill health. He had become a navigator of national reputation, while an experience of some six years in the lumber trade in Providence, Rhode Island furnished an excellent insight into business methods. When Hardy & Everett had the Governor Morton (the first Liverpool packet of clipper model) constructed in 1850, they secured Captain Burgess to superintend her entire building. He was her commander for seveal yeas, after which he was in command of the Monarch of the Seas, then the largest ship engaged in trade between England and the East Indies. In 1874 Captain Burgess had decided to retire from a sea life and was homeward bound from San Francisco when he was washed overboard from the deck of the David Crockett and lost.

On his first passage in the David Crockett, Captain Burgess brought his ship into San Francisco harbor July 3, 1860, 123 days from New York; was 29 days to the line; 64 days to Cape Horn, off which had 14 days of heavy weather; crossed the equator 100 days out. On the return trip he sailed from San Francisco July 24 and arrived at Callao in 47 days; loaded guano at the Chincha Islands; sailed from Callao November 28; and was 72 days thence to Hampton Roads. The following voyage the David Crockett was 113 days from New York to San Francisco and return to New York direct in 88 days. On the outward passage she was 23 days to the line; 51 days to the Cape; 12 days between the 50's; crossed the equator in the Pacific 84 days out. On her sixth Cape Horn voyage she left New York May 8, 1862; was 29 days to the line; 56 days to the Cape, off which was 11 days; crossed the equator 84 days out and was within 400 miles of San Francisco, 110 days out; anchored in San Francisco Bay September 2, 117 days' passage. Returning she sailed from San Francisco November 1 and arrived at Liverpool February 17, 1863, 108 days. The vessel then crossed to New York, loaded for San Francisco, and arrived out October 21, 1863, 110 days' passage; loaded a cargo of grain and sailed December 5; arrived at Liverpool March 14, 1864, 100 days out; crossed to New York with 1350 tons of coal.

Eighth to Fourteenth

On her eighth passage to San Francisco the David Crockett arrived out on January 27, 1865, after the fine run of 107 days. There being but little demand for tonnage out of the Pacific port at the time, she left San Francisco immediately after discharging in ballast for Valparaiso, seeking cargo. She arrived out April 4, 1865, 40 days' passage; obtained a charter to load guano at Paquica for Liverpool. Details of her homeward run are not at hand, but she reached New York February 11, 1866, from Liverpool December 19, 1865, with merchandise consigned to Lawrence Giles & Company of New York, who were then her owners.

Her ninth run out to San Francisco occupied 114 days, date of arrival being August 26, 1866. Captain Burgess reported being 62 days to Cape Horn, off which was 10 days in fine weather; from the equator crossing to port was 34 days, of which 10 days were calms in latitude 37. She sailed from San Francisco September 21 with 1980 tons of wheat and 110 tons of barley for Philadelphia; arrived out on December 25, 94 days' passage.

The tenth westward Cape Horn passage of the David Crockett was made in 110 days, arriving at San Francisco July 22, 1867; crossed the line 20 days out and was up with the Cape on the fiftieth day; from 50 to 50 was 8 days only, with moderate easterly winds; was on the equator in the Pacific 74 days out, after which had 36 days of light northerly winds. Loaded an assorted cargo for New York; sailed August 28 and arrived out on December 20, 114 days' passage. The following outward run was 137 days, with adverse conditions throughout, arriving at San Francisco July 16, 1868. She sailed August 24 and arrived at New York November 27, 95 days. Her receipts were $34,500, currency, for the homeward charter as against $30,000 the previous year. In 1869 her outward passage was 106 days; return, to Liverpool in 114 days, with wheat, at 3 pounds per ton. On the thirteenth run she anchored off the heads, San Francisco, at 8 p. m. August 23, 1870, from New York April 27, 118 days; crossed the line 22 days out; thence 34 days to 50 south; thence 12 days to 50 in the Pacific; thence 19 days to the equator, crossing on the eighty-seventh day out; thence 31 days in light and variable winds and calms. At San Francisco she loaded wheat for Liverpool at 2 pounds per ton, sailed March 11, 1871, and made the passage in 111 days.

The fourteenth passage of the David Crockett from New York to San Francisco was made in 103 days and was the fastest westward run in her career. She sailed from New York November 6, 1871; crossed the line in 20 days; had 30 days thence to 50 south; 12 days later was northbound in the Pacific; on the eighty-second day crossed the equator and was 21 days thence to anchorage, February 17, 1872. From Sandy Hook she had moderate weather until getting into the Pacific, after which light and variable winds prevailed. She returned to New York with a cargo of California products, sailing May 12 and making the passage in 102 days. The following run out to San Francisco occupied 108 days, but that portion from 50 south in the Atlantic to 30 north in the Pacific occupied only 50 days, remarkably fast time; she was 11 days from 50 to 50, thence 25 days to the equator crossing; was 9 days from 30 north to port. Arrived January 26, 1873, and sailed March 22 for Liverpool, which port she reached after a passage of 98 days.

(To be continued.)

OLD PACIFIC WHALERS

Up to seventy-five years ago the chief business of the American merchant marine on the Pacific Ocean was whaling. Even down to the eighties there continued to be considerable whaling in Behring Sea and in the adjacent regions of the Arctic Ocean. Our illustration on the facing page is made from a photograph taken in the late eighties showing four whalers drawn up in the mud on the Alameda shore of the Oakland estuary. Vessels of this type are now only a memory, or form the ground-work for many a thrilling tale of sea adventure.

TRADE AND TRAFFIC TRENDS

A Department Devoted to the Interests of Exporters, Importers, and All Ocean Shippers

PACIFIC-ASIATIC TRADE TRENDS

FROM many consular reports and from the observation of returning commercial travelers, we glean the following summary of probable future conditions and the outlook for 1924 in the principal Pacific Ocean markets for American exports.

Japan

The Japanese government budget, as passed, calls for an expenditure of 468,438,849 yen for reconstruction during the next five years. The government also guarantees 140,000,000 yen municipal bonds for Tokio and Yokohama.

Imports during 1923 showed a net unfavorable excess ovtr exports of 300,000,000 yen. This showing is largely due to increase in imports and the demoralization of the silk trade, leaving large stocks of silk in Japanese warehouses.

Japan's outlook is somewhat uncertain. Much depends upon the policies adopted by the new cabinet which has just been formed, especially as regards their attitude toward the raising of funds to carry out the reconstruction program, and to some degree upon the authorization of loans to the insurance companies for the payment of the 10 per cent insurance "solace" money.

China

In both exports and imports the 1923 trade of the United States with China exceeded that of 1922. The total gain was approximately 26 per cent. There are signs that the political situation is slowly but surely clearing up. At present one of the most important problems is government finance, which can only approach satisfactory solution when and if the authority of the central government is more widely recognized.

An indication of faith in China's commercial soundness and ability to absorb foreign merchandise is found in the increasing competition in all lines among the various nationals. The Chinese are inveterate merchants and transact business under conditions which would be intolerable to any other nation. With stabilized political conditions, and a satisfactory solution of financial problems, China will be freed from its two greatest handicaps to extensive expansion of commerce. Until these conditions exist, it appears that China must struggle along from year to year with indifferent success.

India

The financial and economic system is in healthy condition; a credit balance of 1,125,000 rupees has been accumulated in foreign trade, and easier commercial credit is the rule. Cotton milling is slow; steel industry fair and demanding protective tariff; woolen and jute mills satisfactory; silver, lead, and petroleum good, particularly in Burmah.

The tremendous irrigation projects, which are being financed both by the British government and the native princes, will bring large tracts of desert land under cultivation and should vastly increase the buying power of India's millions.

Australasia

The value of Australia's trade with the United States for the calendar year 1923 was greater by $44,350,000 than in the preceding 12 months, totaling $160,653,000 as compared with $116,303,000 in 1922. Of the total amount, $119,564,000 represented imports from the United States, an increase of $39,044,000 over imports in 1922. This satisfactory growth in trade with the United States is accounted for chiefly by increased imports of machinery, motor cars, lumber, and motor oils, automotive imports showing the greatest expansion.

New Zealand imported from the United tSates in the first eleven months of 1923 twenty-five million dollars worth of merchandise. This amount represents 13.7 per cent of the total imports for that period.

Singapore

In British Malaya during 1923 an effort was made to reduce the heavy government holdings of tin, which had been a dangerous element in the market since 1920. On the other hand, the result of the artificial means of upholding prices has been simply to defer losses temporarily. With rubber production close to the world's consumption and large surpluses in the market, and with tin produced at a rate equal to the world's consumption with considerable stocks still withheld from the market, the prospect of a resumption of trade along normal and safe lines in this territory does not yet appear within view.

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India

The financial and economic system is in healthy condition; a credit balance of 1,125,000 rupees has been accumulated in foreign trade, and easier commercial credit is the rule. Cotton milling is slow; steel industry fair and demanding protective tariff; woolen and jute mills satisfactory; silver, lead, and petroleum good, particularly in Burmah.

The tremendous irrigation projects, which are being financed both by the British government and the native princes, will bring large tracts of desert land under cultivation and should vastly increase the buying power of India's millions.

Australasia

The value of Australia's trade with the United States for the calendar year 1923 was greater by $44,350,000 than in the preceding 12 months, totaling $160,653,000 as compared with $116,303,000 in 1922. Of the total amount, $119,564,000 represented imports from the United States, an increase of $39,044,000 over imports in 1922. This satisfactory growth in trade with the United States is accounted for chiefly by increased imports of machinery, motor cars, lumber, and motor oils, automotive imports showing the greatest expansion.

New Zealand imported from the United tSates in the first eleven months of 1923 twenty-five million dollars worth of merchandise. This amount represents 13.7 per cent of the total imports for that period.

Singapore

In British Malaya during 1923 an effort was made to reduce the heavy government holdings of tin, which had been a dangerous element in the market since 1920. On the other hand, the result of the artificial means of upholding prices has been simply to defer losses temporarily. With rubber production close to the world's consumption and large surpluses in the market, and with tin produced at a rate equal to the world's consumption with considerable stocks still withheld from the market, the prospect of a resumption of trade along normal and safe lines in this territory does not yet appear within view.

AMERICAN ATTITUDE TOWARD FOREIGN TRADE

By IWAO NISHI

Commercial Attache Japanese Embassy at Washington

THE time will come for the purchase of materials for permanent rebuilding of the burned areas of Yokohama and Tokyo as soon as a definite plan of reconstruction has been laid out, and American manufacturers and exporters will have the best opportunity to introduce their products in the Japanese market.

Observations lead us to believe that notwithstanding the fact that the American Government is so enthusiastic for the promotion of foreign trade, the manufacturers are so busy with their domestic market that they are not very eager for foreign trade, whereas most European countries and Japan cannot live without it. When the Japanese government asked for bids for steel sheets and wire nails from the steel manufacturers last November our experience was that some of the American bidders did not have much knowledge of the export business, as well as the exact requirements of the Japanese market. It is true that European commodities have been well introduced into the Japanese markets in the past.

As stated above, Japan must secure her supply of materials from foreign markets. However, for the purchasing of this material we must find a means of financing. For instance, the payment of England's debt to the United States naturally restricts Great Britain's purchasing power in the United States markets. For the first ten months of this year Great Britain not only increased her exports to the United States by more than $55,000,000 but decreased her purchases in the United States by nearly $28,000,000, compared with the same period of last year. Owing to the purchase of materials for urgent needs since the disaster, on one side, and the inability of Japanese manufacturers to dispose of their goods in the United States because of the high tariff and to establish in the United States credits necessary for the purchase of American goods, on the other side, the purchasing power of Japan in this market is gradually diminishing. Recent depreciation in the yen as against the dollar is illustrating this tendency. After all, the economic law rules everywhere. More sales mean more purchasing. In consideration of this mutual interest the outcome of the disaster will without doubt lead to closer relations between the two countries.—Trans-Pacific.

FOREIGN CONTROL OF IMPORTS

SECRETARY OF COMMERCE HOOVER has made an investigation into the sources and distribution of imported raw materials and has found that prices on at least nine groups are adversely affected by foreign monopoly and control.

These materials are monopolized or controlled: Sisal for binder twine by a Yucatan combination; nitrates and iodine by a British agency; potash by German producers; crude rubber and gutta percha through producers in British and Dutch colonies; quinine by Dutch producers; tin by the British; mercury through a common selling agency of Spanish and Austrian mines; coffee by the Brazilian government, and quebracho (for tanning purposes) by a combination of producers and foreign manufacturers.

The prices of these commodities enter into the cost of living of all our people. The value of imports of these commodities last year was over $525,000,000, and prices are undoubtedly much higher than would otherwise be the case.

Hoover recommends extension of the Webb-Pomerene act, which authorizes combinations for purposes of foreign trade to provide for setting up outside purchasing agencies among American consumers to handle these imported materials wherever a monopoly is shown to exist. He believes organization of purchasers can break these monopolies.

MARKING FOR EXPORT

PROPER and distinct marking is absolutely essential in export trade. However carefully an exporter may construct his containers and pack his merchandise within them, if the marking is illegible, easily rubbed off, or becomes blurred and unreadable through dampness or the rubbing to which a package is subjected on an ocean voyage, loss of goods or months of delay in receipt of the shipment are most likely to result. Losses from improper and incorrect marking run into millions. Too much emphasis cannot be placed on correct marking, says the Transportation Division of the Department of Commerce.

American exporters, with many years background in foreign trade, have not overlooked the importance of legible, permanent marking, but criticism has been made of the marking done by careless or inexperienced exporters. The principal causes of complaint have been brush marking often illegible or the use of very small stencils, and ink without indelible qualities.

Lack of attention in consecutive numbering of cases or other containers is another common fault which is certain to make trouble for the importer. The importance of care in this matter is plain when it is realized that in nearly every instance the foreign customer is subjected to fines, or perhaps the loss of his goods. Brazil in particular has promulgated regulations in regard to consecutive numbering, and any departure from these is punishable by heavy fines. In Salvador, goods bearing duplicate numbers are considered contraband, and are liable to a fine of 25 per cent of the duties.

The stencil marking done by Americans is, generally speaking, too small, according to reports from abroad received by the Department of Commerce. Even large cases are marked with one-inch stencils. Our competitors make a specialty of marks from three to five inches high, the consignee's mark and destination being legible at 200 yards, in contrast to the usual American marks of one inch or 1½ inches, which cause delay in discharging, particularly at night, because of the difficulty experienced in reading the small, and sometimes indistinct, marks. Stencils should be not less than two inches, and, on large cases, marks five inches high would not be too large.

In marking bales, marks should not be placed on the burlap itself, nor should tags tied to the bales be used. Some exporters stencil a piece of cotton or canvas with the necessary marks and sew this to the bale. A better way is to mark a metal plate, fastened securely to the metal bands with which the bale is tied. The use of tags should be avoided, as they are easily torn from the package, or, perhaps, become defaced. If tags must be used they should be of metal and securely wired to the package.

All marks should be stenciled. Brush marking, aside from the fact that some few countries prohibit it, is most unsatisfactory for foreign shipments. As a rule the complete marks should be placed on at least two faces of the packages, though some exporters mark on sides, tops and bottoms.

The marks must agree in every detail with those shown on invoices and bills of lading. The whole of the mark should be together, in order to simplify the work of checkers, custom authorities, and others who handle the goods. A prominent place should be given the consignee's name, destination, and routing. These must be in large letters and, if possible, in the center of the face of the package. The weights (gross, tare, net, or legal), cubic measurement, and serial numbers are usually placed in the corners. These are usually stenciled in red by English and German shippers to distinguish them from consignee and destination marks.

That a good quality of black, waterproof stencil ink or paint be used is of prime importance. In case the articles to be stenciled are of a dark color, white ink or paint should be substituted for black. Many excellent waterproof marking inks or paints are available to the exporter. Fountain brushes are commonly used because they insure a clean, legible mark. Many exporters cover all marks with a coating of shellac, which costs but little, yet makes all marks absolutely impervious to dampness, water, or rubbing.

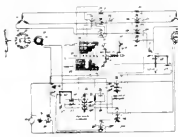
For the information of exporters, the composition of United States Army stencil black standard paint is shown: Pigment, 50 per cent; liquid, 50 per cent. Pigment shall consist of drop black, 50 per cent; calcium carbonate, 50. Liquid portion shall consist of varnish (clear spar), 70 per cent; combined dryer and thinner, 30. The thinner shall consist of turpentine of volatile mineral spirits, or a mixture thereof.

A packing list should be enclosed within each package, showing the contents of the case, as an aid in tracing any losses. Each case should also contain a duplicate set of markings, so that if any or all of the exterior markings are defaced there will still be ample information to insure delivery of the goods to their proper destination.

Where no containers are used for shipment as in the case of solid rubber tires, the marks should be stenciled on some part of the product where they can be easily seen and will not rub off. Shippers of solid rubber tires attached to rims put their marks inside the iron rim in white paint.

MARINE PATENTS OF THE MONTH

1,481,882. ELECTRIC SHIP PROPULSION. Ernst F. W. Alexanderson, Schenectady, N. Y., assignor to General Electric Company, a Corporation of New York. Filed Feb. 16, 1920. Serial No. 358,923. 14 Claims. (Cl. 172—8.)



1. The method of operating an electric system for ship propulsion wherein a propeller is driven by an alternating current motor which comprises operating the motor as a generator to supply current to the generator for breaking the propeller from the water and bringing it approximately to standstill.

1,481,883. STEAM SUPERHEATING SYSTEM FOR MARINE BOILERS. John F. Daukenbaugh, Philadelphia, Pa. Filed May 27, 1919. Serial No. 299,609. 3 Claims. (Cl. 122—409.)

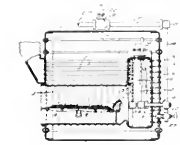
1. In a steam generating system comprising a boiler having fire tubes, a fire box, a bridge wall, a combustion chamber, a water leg, and a crown sheet at the upper end of said combustion chamber, a first header located in said combustion chamber parallel and close to, and just above the bridge wall, and a second header generally transverse to said first header and parallel to said first header, a conduit leading from the steam space of said boiler over the bridge wall to said second header and a compartment of said second header, a series of tubes extending from said compartment of said header in an upwardly and rearwardly direction to a point close to said crown sheet and thence downwardly past the open ends of said fire tubes to said first header, a second series of tubes leading from said first header upwardly past the open ends of said fire tubes to a point over said crown sheet and thence downwardly to the second compartment of said second header and a conduit leading from said second compartment rearwardly through the said water leg to the point of the boiler and thence to the point of consumption.

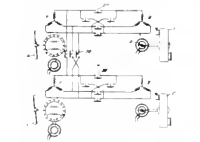
1,481,884. ELECTRIC SHIP PROPULSION. Ernst F. W. Alexanderson, Schenectady, N. Y., assignor to General Electric Company, a Corporation of New York. Filed Feb. 16, 1920. Serial No. 358,924. 15 Claims. (Cl. 172—8.)

1. An electric ship propulsion system comprising an alternating current motor arranged to drive a propeller and adapted to operate with a plurality of torque characteristics, a generator arranged to supply current to operate said motor, a device adapted to operate at a constant speed and means dependent upon the interrelation of motor speed, synchronous speed and said constant speed for controlling the torque characteristic of the motor.

12. An electric ship propulsion system comprising an alternating current motor arranged to drive a propeller, a generator for supplying current to operate said motor, adjustable speed means for driving said generator and differentially operative mechanism arranged to produce a regulating effect varying with changes in motor load conducting in the sense to maintain the motor within a stable range of operation.

1,481,885. ELECTRIC SHIP PROPULSION. Ernst F. W. Alexanderson, Schenectady, N. Y., assignor to General Electric Company, a Corporation of New York. Original application filed Feb. 16, 1920, Serial No. 358,923. Divided and this application filed Sept. 12, 1921. Serial No. 500,025. 6 Claims. (Cl. 172—8.)





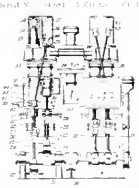
1. An electric ship propulsion system comprising a propeller, an electric motor arranged to drive said propeller, a synchronous motor arranged to drive said propeller, characterized in that fast and slow speeds are provided whereby the motors may be connected together with reversed phase rotation and energized to operate as generators to brake the propellers from the water and bring them to standstill.

1,482,510. DECK BREAKER. John Albert Ellis, Bar Nile, Queensland. Filed Dec. 18, 1922. Serial No. 607,570. 2 Claims. (Cl. 114—40.)

1. In a deck breaker for the combination of a hull, a liquid fuel burning power plant, a fuel pump supplying fuel to said power plant, means for controlling the admission of water to said hull, said means governed by the demand of said power plant for fuel to control the operation of said fuel pump and said water admission means.

1. An deck breaker comprising in combination with the hull of a boat supporting members on which is arranged a plurality of spaced guide ways mounted on the supports and designed to extend outwardly in transverse formation relative

1,482,796. ENGINE. Karl Otto Keller, Sunderland, England, assignor of one-half to Robert Pole Dorford, Sunderland, Durham, England. Filed June 5, 1920. Serial No. 387,063. 5 Claims. (Cl. 123—117.)



1. In an engine [illegible] which [illegible] and approximately [illegible] and [illegible] for the first [illegible] and [illegible] with the first [illegible]

1,483,170. TIME FUSE. [illegible] Washington, D. C. Filed [illegible] 1921. Serial No. 490,674. 4 Claims. (Cl. 102—78.)

4. [illegible]

1,483,529. MARINE SIGNALING APPARATUS. [illegible] and H. [illegible] Cambridge, Mass. Filed [illegible] 1922. Serial No. 561,000. 7 Claims. (Cl. 177—329.)

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PORTS OF THE PACIFIC

IMPROVEMENTS DEVELOPMENTS ACTIVITIES

A SURVEY OF PORT IMPROVEMENTS

THE following summary of a few of the activities and proposed improvements in ports on the Pacific Ocean rim shows that in practically every maritime country around this great basin investors and statesmen are anticipating improved conditions in trade. In fact along some lines shipping is showing very decided improvement and the ships of the world seem to be gravitating toward the Pacific. During 1923, for the first time since its opening, the Panama Canal traffic in merchant vessels has overtaken and passed the high mark set by its great rival, the Suez Canal, and we may confidently look for a tremendous expansion in Atlantic-Pacific trade by this route for many years to come.

Grain Elevators and Other Improvements for Vancouver

The great demand for elevator space at Vancouver, owing to the increase in grain shipments via that port, has been instrumental in the publication of various projects for building additional grain elevators to accommodate this ever increasing trade. A representative of Spillers, Ltd., English firm, stated that they have set aside $15,000,000 as their share in the development of this western trade route. A. Ingram, their engineer, is peparing plans for a $2,500,000 grain elevator. Another project is the Panama Pacific Grain Terminals, Ltd., capitalized at $1,000,000, with headquarters in Regina, Saskatchewan, which has been granted charter to erect a $750,000 private grain elevator at Vancouver. A total of 24,663,017 bushels of grain were shipped through Vancouver during 1923.

FOREIGN COMMERCE OF THE PORTS OF THE UNITED STATES FOR THE FISCAL YEAR 1923, AS PREPARED BY THE UNITED STATES SHIPPING BOARD

Showing Cargo Tonnage in Excess of 100,000 Tons, Handled At Each Port

Port	Imports	Exports	Total
New York	11 802 820	10,632,797	22 435 617
New Orleans	3 897 659	3,514 858	7 412 517
Philadelphia	4 064 104	2 817 053	6,920 157
Baltimore	3 112 513	3 283,879	6,096,392
Boston	1 284 744	474 319	1 758 063
Buffalo	4,267 806	314 950	4 582 756
Port Arthur	2 287 224	1,118 158	3 345 482
San Francisco	1 104 746	1 968 102	3 072 928
Galveston	1 612 020	1 328 752	2 940 772
Los Angeles	620 196	1,530 716	2 150 912
Norfolk	651 102	1 105 956	1 757 058
Cleveland	228 910	1,163 109	1 392 019
Toledo	164 140	1 190 778	1 354 918
Portland, Me	556 236	680 174	1 236 410
Portland, Ore	83 710	932 113	1 015 823
Baton Rouge	147 450	816 290	963 725
Perth Amboy	86 780	72 117	958 897
Mobile	270 835	642 180	912 025
Chicago	94 602	804 780	899 382
Seattle	457 097	426 101	874 198
Ashtabula		865 618	865 618
Newport News	63 543	700 887	764 430
Providence	761 107	103	761 210
Tampa	255 721	485 306	741 027
Fall River	706 577	33 607	740 184
Rochester	110 191	589 029	729 220
Houston	318 284	380 539	707 822
Toledo, O		699 167	699 167
Erie, Pa	128 459	244 458	672 917
Tacoma	250 691	327 780	648 471
Superior, Wis	30 772	602 211	642 983
Savannah	148 259	203 420	641 679

Coal bunkers will be erected this year by the Vancouver Board of Harbor Commissioners at a cost of $500,000. It is proposed to make Vancouver the outgoing port for great quantities of coal from Alberta and the Princeton district of British Columbia.

According to advices received from Vancouver a sum of approximately $18,000,000 will be requested from the Dominion government for improvements at this port. The new projects to be considered will be a cold storage plant, a fishermen's wharf, a booming ground on SpaSnish banks, terminal railway on the north shore, a lumber assembly wharf, and a car ferry terminal.

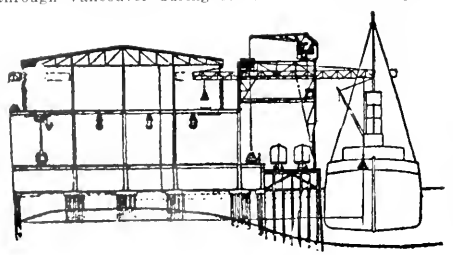
Prince Rupert.—A grain elevator of 1,000,000 bushels capacity may also be built at Prince Rupert, British Columbia, according to report given out by C. P. Coles of Vancouver, British Columbia, agent of Kerr, Gifford & Company.

Alaska's commerce for the year 1923 showed an advance over the previous year. The total value for the year was $94,075.748, a gain of $6,538,275 as compared with 1922. Shipments into Alaska amounted to $31,300,441. The principal shipments from Alaska to the United States are canned salmon and copper ore.

Guatemala.—A British group has obtained a concession from the government of Guatemala for the construction of a new port on the Pacific Coast half way between San Jose and Champerico, the new port to be known as Concepcion del Mar.

Yokohama.—With huge quantities of freight in boxes and barrels piled along the waterfront and 40,000,000 feet of lumber at Honomoko Beach, just south of the city, the harbor congestion of Yokohama is becoming quite serious. The rapid increase in imports since the earthquake and the insufficient docking facilities have brought about great congestion of vessels. Vessels lying at anchor at Yokohama February 15 number 132. However, general conditions have been improved by the construction of the berthing jetty and an increase in the number of barges.

Kobe.—There has been agitation for some years toward establishing another silk exporting port in Japan, namely Kobe. The government has been unfavorable to any such change, as authorities maintained they were satisfied with the way silk shipments



IMPROVED PIER CRANE

Through the courtesy of the Department of Commerce, we are enabled to present to our readers this diagrammatic sketch showing the general outline of an improved crane which has been installed on new docks at Hamburg.

As will be seen from the sketch, this consists of combining a half portal gantry with a transporter bridge, both the bridge and the revolving crane at the top of the gantry being set high enough to clear the ordinary ship's tackle, so that in loading or unloading, the revolving gantry crane and the ship's tackle can work on delivery to car or outside pier, while simultaneously the transporter hoist can deliver to pier warehouse. It is said that this combination shows a very decided gain in dispatch of cargo, both loading and unloading.

were being handled through Yokohama. The destruction of Yokohama by the earthquake has again brought this movement to the fore and Kobe is now prepared to make a strong bid for silk shipments. Three warehouses are to be built. Permission has been granted by the authorities for a new warehouse to be built by the Toshin Soko at the new customs compound. This warehouse will cover approximately one and three-quarters acres, and will be built of reinforced concrete. will have five stories, and several elevators. Application has been made by the Sumitomo and Kawanishi warehousing companies to build similar warehouses near the port dock.

Saigon.—A French company plans to make the Port of Saigon, French Indo-China, a modern port, according to Commerce Reports, Reference No. 119663. The improvements are contingent upon the cession of the port to this company by the government for a period of 65 years. The developments will consist of piers, warehouses, loading machinery, and so forth.

Karachi, India.—The port of Karachi, one of the two principal sea ports of India, will have additional steamer berths when the new wharves now under construction are completed. The berths, capable of accommodating the largest class of vessels, will be 600 feet long and will be equipped with the latest type of electric cranes and two-story warehouses, capable of accommodating 12,000 tons of cargo opposite each berth.

* * *

Hawaiian Islands. There is a great deal of harbor improvement activity now going on at the various ports of the Hawaiian Islands and the approval of the Hawaiian Bill of Rights by Congress will be instrumental in bringing to the islands the necessary funds for further much needed improvements of harbors. The constant increase in the production of pineapples and raw sugar for export is necessitating the developing of new shipping ports.

The Ewa end of the harbor at Honolulu, where the Oahu Railroad Company maintains its wharves, is being rebuilt and enlarged at the cost of several hundred thousand dollars. The harbor board of Honolulu awarded a contract recently to Ralph E. Wooley for the reconstruction of Kuhio Wharf (No. 1) at Hilo for $296,300. The old wharf was of wooden construction and will be practically rebuilt, concrete being used wherever possible.

A harbor is being dredged and breakwater completed at Kaumalapau, on the island of Lanai, for the Hawaiian Pineapple Company. The harbor of Kaumalapau was selected by the pineapple company as the most suitable site for the company's main port and improvement plans have been approved by the Federal government.

Work was started the first of the year on the construction of a breakwater at Hilo. The Hawaiian Dredging Company, Ltd., was awarded contract for the work, which will cost $360,000, funds for which are provided by congressional appropriation.

Probably the most important harbor improvement work to be done in the near future in the Hawaiian Islands is the improvement of the harbor at Nawiliwili on the island of Kauai. Many years ago the islands were surveyed by Army Engineers, and Nawiliwili was judged the most suitable location for a deepwater harbor for the island—in fact, the best in the Territory. However, due to delay on the part of the Federal government in starting improvements the two large sugar producers of Kauai started improvements at Port Allen and Ahukini to facilitate shipping their sugar, involving the expenditure of large sums of money. A breakwater has been built at Nawiliwili and it is now being extended. When the breakwater is completed the inner harbor will have to be dredged and a suitable wharf built in order to accommodate shipments of sugar from the two large plantations. Two roads will have to be built to connect the plantations with the wharf. It is a question of whether further expenditures and the building of the wharf at Nawiliwili will be warranted in view of the shipping facilities already provided at Port Allen and Ahukini, but as these two ports provide inadequate protection to ships and cargoes, it is the consensus of opinion that the harbor of Nawiliwili will in the long run effect savings that would warrant the abandonment of the other two ports when the work planned by the Army Engineers and the territorial authorities is completed.

Long Beach. It is quite probable that the near future will see great harbor improvement activity at Long Beach, California. During February two very important tentative projects were made public. One is the probable construction of a $5,000,000 steamship and railroad terminal by the Union Pacific System to be used jointly by the railroad and the United Fruit Company's steamers. The other project is the building of a terminal by the Southern Pacific Company and the Robert Dollar Steamship Lines. These two terminals would be located on what is known as the turning basin. The Pacific Coast Steel Company has been contemplating the erection of a plant at Long Beach providing the harbor is developed sufficiently to take care of the company's business.

The City Council of Long Beach has asked for bids for dredging the harbor to a depth of 40 feet and connecting the channel between Los Angeles and Long Beach harbors, and tentative contracts have been placed with four firms for this work, providing the citizens of Long eBach approve a bond issue for $3,500,000 at a special election to be held the end of March. The tentative contracts which have been awarded are as follows:

The United Dredging Company of New York and Los Angeles, for deepening of the turning basin, 12.49 cents a foot or $317,495.80 for the removal of 2,542,000 cubic yards of silt.

Fred C. Franks, San Francisco, dredging channel No. 2 at 11.7 cents a yard, or $191,880 for the job.

The Los Angeles Dredging Company, dredging channel No. 3, to cost $208,206.

San Francisco Bridge Company, dredging of connecting channel between the two harbors, $173,165.

* * *

Los Angeles. Shipments of petroleum and its products from Los Angeles harbor during February totaled almost 7,000,000 barrels, according to a report issued by the Marine Exchange of the Los Angeles Chamber of Commerce. The figures are, 5,057,980 barrels of crude oil, 1,246,774 barrels of fuel oil, and 530,377 barrels of gasoline, kerosene, diesel oil, and distillate. The McCormick Steamship Company has been given a contract for Berth 57, Municipal Pier 1, and a transit shed to cost $64,500 is being built by the harbor. Negotiations are being started by the Harbor Commissioners with the Southern Pacific Company to take over the railroad company's holdings at San Pedro.

* * *

Portland, Oregon. According to figures compiled by the Bureau of Agricultural Economics at Portland based on custom house records of the entire country and supplemented by the Bureau's own figures, the Portland-Astoria district exported more American-grown wheat during 1923 than all of the ports of the United States combined. During

1923 this district exported a total of 18,847,781 bushels, while the figures for all Pacific Coast ports are 24,167,415 bushels, and for all ports of the United States are 56,777,596. These figures, of course, do not include Canadian grown wheat shipped through American ports.

* * *

San Francisco. The old Mission Rock Company, which for the past forty years has operated a warehouse on Mission Rock, a solid rock formation situated a few hundred feet out from the China Basin area of the San Francisco waterfront, has been reorganized with Harry S. Scott as president. This reorganization of the Mission Rock Company followed the purchase of the rock by the San Francisco Terminals, Inc., which firm was organized for the purpose of building and operating extensive terminal facilities on this rock, which is the only privately-owned property on the San Francisco waterfront. It is estimated the new terminals will cost in the neighborhood of five to seven million dollars. Members of the San Francisco Terminals, Inc., include president, Harry S. Scott, president of the General Steamship Corporation; vice-president, Marshall Hale, of Hale Bros.; George M. Bowles, vice-president of the American Bank; Harvey M. Toy, hotel owner and president of the Highway Commission of California; William M. Abbott, vice-president and general counsel of the Market Street Railway Company, and Felix Kahn of the contracting firm of McDonald & Kahn.

New Pacific Coast Incorporations

Shipyards, Inc., San Diego, California, has been incorporated for $50,000 to own and operate shipyards.

Harbor Dredging Company, Aberdeen, Washington; capital stock $50,000; incorporators, W. R. Osborn and M. L. Osborn.

Roosevelt Highway Ferry Company, Newport, Oregon, $20,000; O. F. Jacobson, M. H. Abbey and Lester Martin.

Crown Terminal Company, organized by Richard F. Sheridan and Charles [illegible] Tait, to take over the terminal [illegible] the Furness Line at San Francisco.

San Juan Fuel Company, Seattle, Washington; [illegible] Jessie M. Leisen, William F. Thornton and W. L. Stone.

West Coast Navigation Company, Portland, Oregon; $410,000; Robert Sabin, Jr., Forest S. Fisher and Margaret Calderwood.

Western Dredging Company, San Francisco; capital stock $250,000; subscribers, Harry P. Franklin, Harry Lesser and Paul S. Honberger; attorney, Randolph V. Whiting. Monadnock building.

Freight and Charter Report

March 19, 1924.

Since our last report, dated Feb. 15, the charter market has been extremely quiet in the way of fixtures in all directions from this coast. The demand for tonnage for grain for the United Kingdom has fallen off, the only fixtures reported being as follows: Japanese stmr. Chifuku Maru, wheat, United Kingdom or Continent, taken by Strauss & Co., terms private; British stmr. Sheaf Mount, same business, 38 9, April loading, by Balfour, Guthrie & Co.; British stmr. Riol, 39.-, March, by C. Dryfus & Co.; British stmr. Benlawers, terms private, April-May, by Kerr, Gifford & Co.; an 8000-ton steamer is reported for May loading at 40.-, charterers not stated; Danish stmr. Marie Maersk is reported taken for grain for Shanghai, neither the rate nor the name of the charterers having been given; British stmr. Dundrennan is fixed for Shanghai for grain to take the place of stmr. Elveric chartered by Balfour, Guthrie & Co. in January; Dutch stmr. Tjikandi is reported taken for the same business by Kerr, Gifford & Co., rate not stated.

There are no fixtures to report for lumber in the direction of Australia and the only business reported for Japan is the small British stmr. South American by J. J. Moore & Co., terms private, and the Liekanger for the same business by Yamashita Co. to take the place of the Tatjana, recently wrecked.

For Africa the Norwegian sailing vessel Derwent has been fixed for lumber from British Columbia at $18.50 per thousand. The small British stmr. Ardanza was fixed for lumber from British Columbia to London by H. R. MacMillan Export Co., terms private, and the same charterers have taken British stmr. Cape Recife for May loading for discharge in the United Kingdom at 70/- per thousand feet on ties, 75/- on crossings, and lumber at 80/-.

The only market that continues to maintain any strength is in lumber from the North Pacific to the Atlantic seaboard of the United States, American stmr. Freeport Sulphur No. 5 having been taken by Dutton Lumber Co., terms private; American stmr. Nebraskan for New York by Nettleton Lumber Co. at $14.50 per thousand feet; American stmr. Suruga for North of Hatteras at $14.50; American stmr. Albert Jeffress, $15, prompt March loading; British stmr. St. Dunstan from British Columbia at $14.50, both for North of Hatteras.

In time charters American stmr. Point Lobos was fixed for six months for Pacific and Gulf of Mexico trading, taken by Swayne & Hoyt; American stmr. Eldorado, 6 months coastwise, by Charles R. McCormick & Co.; American stmr. Caradetta, four months' business for Alaska trade, by Carlisle Packing Co.; British stmr. Hazelside, one trip, delivery Pacific Coast, redelivery Japan, March, 4 9, by J. J. Moore & Co.

For coal from Newcastle, Australia, to the West Coast of South America, American barkentine Phyllis Comyn was fixed for a nitrate port at 19 6; American sailing vessel E. R. Sterling for the same business at 20 6; American barkentine Hesperian is also reported fixed for the same business, but no particulars have been given. The tanker Watertown is fixed for crude oil from San Pedro to North of Hatteras, terms private.

The Hammond Steamship Co., with offices at Los Angeles, have bought Norwegian stmrs. Hanna Neilsen, Neils Neilsen and Luise Neilsen at a reported rate of $23.50 per deadweight ton.

PAGE BROTHERS, Brokers.

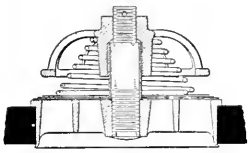
AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

KINGHORN MULTIPLEX PUMP VALVES

ONE of the biggest problems in the design of reciprocating air pumps is the valve. In fact it might be said to be the one problem, upon the successful solution of which depends the entire capacity and working ability of the pump.

Many devices have been designed for the purpose of overcoming chattering, breaking of valves, excessive noise in operation, and other objectionable features in connection with the functioning of dead-lift valves. The most successful solution is the Kinghorn valve, to which Sterling's "Handbook for Marine Engineers" pays the following tribute:

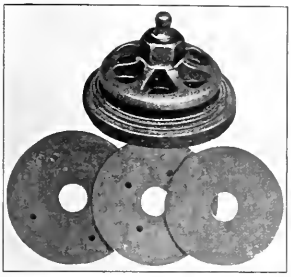
"The Kinghorn Valve, which is without superior for high class air pump service, is generally used for vertical simplex beam, twin beam, twinplex beam, vertical single-acting, and vertical double-acting air pumps. It consists of three bronze disks about 1/32 inch thick, placed loosely together, making a strong, flexible, and long-lived unit, which will seat absolutely tight and adapt itself to conditions as they are found. A conical spring holds the valve on its seat, and a broad guide protects it on the rise. This type of valve can be used also on any of the many types of water pumps, and although this will increase first cost, it is highly recommended for efficiency and durability."



Section through Kinghorn Multiplex Pump Valve

In the development of this valve much research work has been carried on to determine the most suitable alloy from which to make the disks. This has resulted in "Kinghorn bronze," which has been proved under very hard service conditions to have a very high degree of durability and efficiency.

It will readily be seen that a valve disk composed of three loose laminations is thoroughly cushioned at each impact against the guard or the seat, through the presence of moisture or air between laminations. This cushioning is insured by small holes in the two lower disks staggered so that there is no through passage way.



Kinghorn Multiplex Pump Valve and three Kinghorn Metal Discs

In the event of a fracture in one of the laminations the remaining two will preserve the action of the pump over a considerable portion of time with very little loss of efficiency and at the first opportunity a spare disk can be installed, allowing the other two disks to remain.

These valves can be fitted to any circular grid or stud, the guard only being renewed. Cost of fitting and maintenance is lower than the great majority of metallic valves. The Kinghorn valve is particularly suitable to high speed pumps. For all valves of moderate diameters, Kinghorn multiplex disks will be found very economical, very durable, and very efficient.

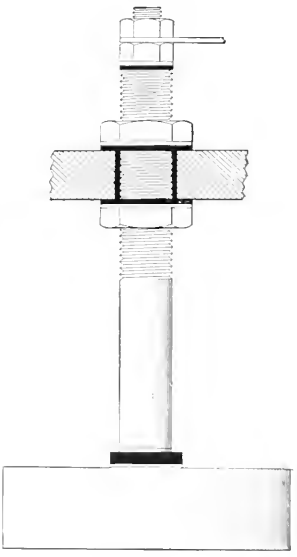
The Plant Rubber and Asbestos Works, San Francisco, are sole agents on the Pacific Coast for Kinghorn patent multiplex pump valves and for Kinghorn metal.

Electrolytic Protection for Condensers

CORROSION and scale formation in boilers and condensers have always been a source of many troubles to the marine engineer. It has long been recognized that corrosion, particularly, and much of the scale action in boilers of condensers are due to a combination of electrochemical actions and that the most effective method of prevention was the electrolytic method.

The electrolytic method has been in use for many years in the form of zinc and steel slab protectors, through definite galvanic actions of low electromotive force, the slab protector being strongly electropositive in comparison with the boilers and condensers. In more recent years much better results in the prevention of corrosion have been obtained by substituting, for the protectors, a direct electrolytic system with an outside source of electromotive force adjustable to the particular conditions in hand.

In order that an electrolytic system shall be economically successful, it must combine mechanical simplicity with reliability and electrical efficiency. These principles are embodied to a marked degree in the



The Kirkaldy Anode

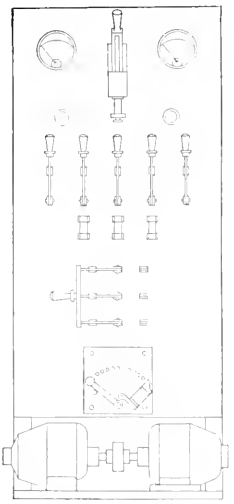
design of the Kirkaldy electrotlytic system of protection.

This system of protection is composed of a number of anodes fitted in each steam drum of a boiler or in the circulating water spaces at the back and front ends of the condenser. The anodes are supported by specially designed plates insulated from the boiler or condenser, capable of being regulated as to the position of the anode and supplying to the anode, through a special insulated conductor, the current necessary for setting up the electrolytic action required in the liquid contents of the boiler or condenser.

Current is supplied from a battery or a motor generator, connected to the anodes through suitable specially designed connections and switch boards, whereby it may be adjusted and directed to suit the needs of the particular installation.

The above factors having been suitably installed, the circuit is completed by grounding the boiler or condenser shell and the negative pole of the source of current supply. These arrangements being complete and the power switches closed, a positive current is transmitted from the anodes through the water in the boiler or condenser to the wet surfaces of the boiler or condenser. These surfaces then become negatively charged and maintain an electrolytic effect upon the water so as to continuously counteract the corrosive and scale forming properties of the impurities contained therein.

The particular features of the Kirkaldy system which distinguish it from other electrolytic systems are: anodes adjustable with relation to the tube plates within the condenser; anodes for condensers having surface area for electrical discharge that is practically constant during the life of the anode; and current supply plates assembled with minimum amount of exposed insulation within the boiler or condenser.



Electrical Equipment

The switchboard and rotary transformer composing the electric equipment for the Kirkaldy electrolytic system of protection against corrosion.

The effects of long use of the Kirkaldy electrolytic system show that it reduces fuel consumption and increases the efficiency and life of the plant, prevents corrosion and scale formation, eliminates retubing of condensers, reduces boiler cleaning and repairing, and permits continuous operation of the power plant.

The Kirkaldy electrolytic system of protection is manufactured and distributed in the United States by the Kirkaldy Engineering Corporation, 52 Vanderbilt Avenue, New York City.

Anaconda Condenser Tubes

THE American Brass Company has for many years conducted a careful study of condenser tube corrosion. Technical research, substantiated by actual experience, has proved that of the present available commercial alloys Admiralty alloy (70 per cent copper, 29 per cent zinc, 1 per cent tin) is the composition best suited for tubes for steam condensers. It is the alloy which should always be used with sea water, brackish water or polluted fresh water. When clean fresh water is available for cooling 70-30 brass is recommended, or even Muntz metal (60 per cent copper, 40 per cent zinc) may be successfully used.

The American Brass Company in the manufacture of Anaconda condenser tubes uses Anaconda mined and electrolytically refined copper and zinc—metals of highest quality and purity.

The physical quality of soundness of the material and the perfection of the surface are second only in importance to the composition of the tube. The process used in starting the manufacture of Anaconda tubes makes very little difference in their physical qualities, as the metal in all stages of fabrication is carefully inspected, to insure a product free from defects being furnished the consumer. The absence of slivers in tubing reduces the likelihood for corrosion with a resultant longer life, for experience has shown that corrosion is likely to start at such defects.

Two processes are commonly used in the manufacture of Admiralty and "70 and 30" condenser tubes. These are the "cupping" process, in which the tubes are drawn down from heavy cups pressed from discs of rolled metal, and the "cast shell" process, in which the tubes are drawn from heavy hollow castings. The cast shell process when properly controlled has always been a satisfactory commercial method of producing high grade seamless tubes, such as are used in condensers.

In response to urgent demands of prominent power plant engineers for greater physical perfection in condenser tubes, the American Brass Company in 1910 became the pioneers in the adaptation of the cupping process to the manufacture of condenser tubes. Prior to that time the cupping process had been used only for the forming of large copper discs into boiler shells, and for the manufacture of tubes of extra large diameter. The cupping process permits the cleaning and inspection of the surface of the plates of metal before the operations of drawing begin. As a result when tubes are manufactured by this process physical imperfections may be reduced to a minimum. This is usually found to be the case when such tubes are given the final mill inspection. On the other hand, experience has shown that condenser tubes produced from well made cast shells of clean metal, fabricated to meet the general requirements outlined in this pamphlet, will give service equal to that of tubes made by the more costly cupping process.

Cast shell process tubes made by the American Brass Company in 1908 and installed in a condenser using polluted sea water for cooling are still in use after fifteen years of service. Also, some of the largest users of condenser tubes have decided, after service comparisons, that cast shell process tubes are giving satisfactory service and that there is no practical or economic advantage in specifying tubes made by the cupping process. The American Brass Company does not hesitate, therefore, to recommend the use of cast shell process condenser tubes, but it is prepared to furnish tubes made by the cupping process to

those engineers who require the nearest possible approach to physical perfection.

All Anaconda condenser tubes are given a special low temperature anneal which removes all indication of strain or deformation of structure due to drawing, and at the same time allows sufficient temper to withstand packing in the tube sheets.

As a result, Anaconda condenser tubes are absolutely free from splitting and will give the greatest length of service under any working conditions.

Anaconda condenser tubes are made at the Waterbury, Connecticut, Torrington, Connecticut, Buffalo, New York, and Kenosha, Wisconsin, mills of the American Brass Company.

New Line of Air Motor Hoists

THE Ingersoll-Rand Company has recently developed a new line of air motor hoists in five sizes, ranging from 500 to 10,000 pounds' capacity. These hoists contain all the essential details which long experience dictates and many new and distinctive features, including: compactness of design, resulting in minimum head room requirements; relatively light weight; automatic brake, which positively holds the load under all circumstances—even if the air supply be disconnected of fail; and a graduated throttle which permits a very close regulation of both the lifting and the lowering speeds.

A balanced three-cylinder air motor is used which operates in either direction and without vibration at any speed or load within the rated capacity of the machine. The motor is of the same reliable type such as has been provided for Ingersoll-Rand hoists. It retains all of the best features which have established their worth by long service, and furthermore embodies new features which add to its economy and durability. Some of the advantages of this motor are its freedom from vibration, the ready manner in which it can be throttled down slowly at all loads and its remarkable absence of lubricating troubles, even when subjected to considerable neglect.

It should therefore be noted that these hoists are entirely distinct from direct acting cylinder hoists and lifts. The latter consist essentially of only the plunger and a case. The Ingersoll-Rand air hoists, on the other hand, are equipped with a high powered and efficient air motor which is geared through a mechanical train to a hoisting drum.

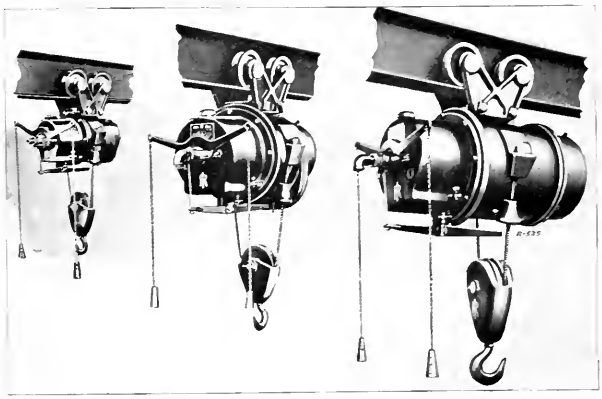
The lubrication of all parts has been thoroughly provided for. The motor and gears are both enclosed. The motor operates in a bath of oil and the gears turn in a heavy grease. Oil passages lead to all bearings.

Ball bearings or bronze bushings are provided at all points where experience has indicated they will add to the efficiency or life of the hoist.

The hoists are capable of standing up remarkably well under hard service. If a hoist is overloaded it is only necessary to remove the overload, after which the hoist will start up and work again as well as ever.

A roller bearing mono-rail trolley or top hook mounting can be provided as desired. The trolley mounting reduces considerably the head room necessary for installing. Further, because of its rigidity, which enables an operator to easily start a loaded hoist along a runway, it proves more satisfactory than hooking into a separate trolley unit.

This new Ingersoll-Rand line of air motor hoists is especially adaptable to rough outside work in foundries and shipyards, the hoists adapting themselves readily to varying air line pressures of 50 to 100 pounds. They make a very handy unit for service to large machine tools.



Three of the five sizes of the new line of Ingersoll-Rand air motor hoists

Size	A	B	C	D	E
Capacity (lbs.)	500	1000	2000	4000	10,000
Feet lift per min. (80 lbs. Air Pres.)	50	25	25	17	10
Max. lift feet	15	15	15	15	15
Size and length Wire Rope	¼″ x 35′	¼″ x 35′	5/16″ x 36′	3/8″ x 36′	9/16″ x 40′
Net Weight, (equipped with top hook lbs.	150	150	315	425	760

Table showing the principal characteristics of Ingersoll-Rand's new line of air motor hoists

IMPORTANT CORY INSTALLATIONS

AUTHORIZATION to furnish self-synchronous direct current engine and docking telegraph systems has been received by Chas. Cory & Son, Inc., for the new 12,000-ton Ford motorships, building at the American Ship Building Company and the Great Lakes Engineering Works.

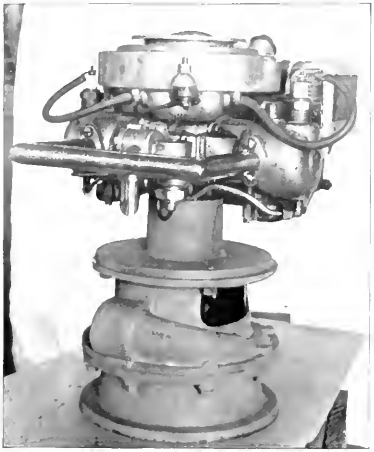
Cory anti-noise telephones (Magnavox patents) will transmit navigation control conversations.

Cory electric whistle valve, automatic whistle valve operation, and associated parts will be used.

A departure from the customary finishes is being made. Highly polished nickel surfaces on all the instruments will make for exceptionally pleasing appearance.

A Handy Pump Unit

THE illustration accompanying this article shows a very neat, compact, direct-connected, gasoline-driven vertical turbine pump, which is being introduced into the Pacific Coast market by A. G. Hebgen of San Francisco. The pump is of California manufacture and carries a circular spacing member upon which is supported a Johnson two-cylinder gasoline engine of the outboard boat motor type.



The Sterling vertical centrifugal pump direct-connected to an opposed two-cylinder gasoline engine, making a very handy portable pump unit.

The advantage of a pump designed and built in this fashion is compactness, portability and possibility of running without foundation fastenings. The entire outfit may be carried in one hand, using the handle shown in the picture. Its entire weight is 52 pounds and its outside measurements are 12 inches by 12 inches by 15 inches in height.

The pump works on a $1^1/_2$-inch suction centrally located underneath and has a $1^1/_4$-inch discharge tangentially located on the outer circumference of the casing. The pump rotor is so designed that it automatically frees itself of all air or gas and consequently holds its priming to a greater degree than other types.

The compact design of the pump eliminates pulleys, bolts, gears, chains, couplings, and other unnecessary trouble-making features. There are absolutely no moving parts exposed except the smooth steel shafting connecting the engine drive to the pump rotor. The stuffing box of this shaft is packed with the highest grade of metallic packing and will give good service for years without renewal.

On a suction lift of 15 feet, tests of the pump have shown capacities of 38 gallons per minute against a head of 40 feet or 12 gallons per minute against a head of 100 feet, with proportional figures at intermediate heads. These pumps can be used for deep wells by using a supplementary turbine equipment and with this equipment will lift water on suctions up to 60 feet. This handy pump unit should be of considerable value for various emergency and daily uses on workboats and yachts.

Fuel Economizers

ALMOST every time you read technical magazine advertisements you will note various ways of saving fuel in your boiler plant. After figuring the total savings you find that by taking advantage of all these devices you have gone over the 100 per cent mark. Most of these devices will save some money—how much, depends on the method of plant operation.

In a very poorly operated plant, most any improvement shows up big. The majority of plants stop-up nearly all the leaks by careful operation, but the biggest leak of all is not stopped up when an expensive chimney is provided to take the hot gases out of the plant. In the ordinary plant 40 per cent of the heat in a pound of fuel goes up the stack and does nothing but heat the sky. Engineers who realize this, and who have seen other plants save large sums of money, are taking steps to cut the loss in half. You cannot save all of this waste, but you can save 10 per cent of your fuel bill, and sometimes more, with Sturtevant fuel economizers.

There is a Sturtevant fuel economizer engineer in your territory. Why not let him investigate your plant and give you an idea of costs and savings?

NEW POWER PLANT FOR THE STEAMER CITY OF LOS ANGELES

THE installation of the new power plant in the **Los Angeles Steamship Company's** passenger liner City of Los Angeles is well under way at the plant of the **Los Angeles Shipbuilding & Dry Dock Corporation.** The entire plant is being removed and new machinery substituted therefor.

The City of Los Angeles was powered with five double-end and two single-end Scotch marine boilers, with 25,833 square feet of heating surface, and twin triple-expansion engines of 9000 indicated horsepower. With this plant she developed an approximate speed of $14^1/_2$ to 15 knots per hour fully loaded at sea. The prime object in replacing this machinery was to increase the speed of the vessel to approximately $16^1/_2$ knots at sea fully loaded, which made necessary the installation of machinery developing 12,000 shaft horsepower in the same space occupied by the old boilers and engines.

Compound geared turbines and water-tube boilers were decided upon, and the entire layout of auxiliary machinery necessary was worked out by the engineers, with the result that there is now being installed in the vessel eight **Babcock & Wilcox** water-tube boilers, with 35,200 square feet heating surface, and two Curtis compound steam turbines, constructed by the **Fore River Plant** of the **Bethlehem Shipbuilding Corporation,** each turbine developing 6000 shaft horsepower. Each of these turbines will be connected through **Falk** single reduction gearing to the propeller shafts.

It was found desirable, in order to cut down expenses, that the same propeller shafting, which was in perfect condition, should be conserved. With this idea in mind, new propellers were designed so as to take the full power of the turbines at 130 revolutions per minute. The shafting had formerly transmitted 9000 horsepower on two shafts at 81.5 revolutions and was therefore amply strong to transmit 12,000 horsepower at 130 revolutions with a large factor of safety. The propellers, as designed, are of the three-bladed built-up type with cast steel hubs and blades of manganese bronze. They are 15 feet diameter, 14 feet 3 inches pitch, with 72 square feet projected area.

Two contraflow condensers of approximately 8000 square feet cooling

(Continued on page 64, Ad Section)

A NEW TIMBER FOR BOAT BUILDING

Bagac, a Philippine Islands Wood, Found to be Especially Suited for Ship Framing

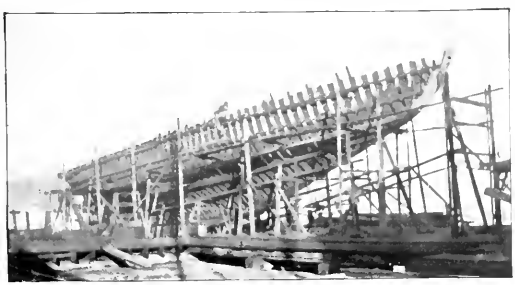
F great interest to the Pacific Coast boat and shipbuilding industries is the recent introduction of a tropical timber, known as bagac. This wood has for some years been widely used by European shipyards, replacing in many instances the more expensive timber teak.

A San Francisco firm, Cadwallader-Gibson Company, is now introducing this timber for Pacific Coast use. Under severe tests at the Engineering Experiment Station of the University of Washington, bagac samples were compared with the best oak, and it was found that in the average value of modulus of elasticity and of fiber stress, bagac is very much superior to oak. Like teak, bagac contains preservative oils, which make it immune to dry rot. These two qualities combined would seem to make an ideal timber for ship framing.

After thorough investigation of the new timber, Lee, Brinton, and Wayland, naval architects of San Francisco and Seattle, recommended its use in the new auxiliary schooner yacht designed by them for R. Cliff Durant. This schooner is now building at the yard of J. H. Madden & Company, Sausalito, California. The illustration shows her general lines in framing. She is to have an overall length on deck of 104 feet and length on water line of 85 feet; beam of 23 feet; and draft of 12 feet. In general lines of hull, rigging, and spars she conforms to the standard East Coast fishing schooner.

For auxiliary power the new yacht will be equipped with an 80 horsepower 6 cylinder Winton gas engine. Electrical equipment will be installed throughout for lighting, heating, ventilation, and cooking. Power for these purposes will be supplied by a Winton 5 kilowatt generating set. The vessel will also be equipped with an electric anchor windlass and an electrical winch for handling sails and spars. Accommodations will be provided for 11 in owner's party and 8 in crew.

The entire framework is of bagac and it will be of interest to Pacific Coast boat and shipbuilders to know that this timber is grown mainly in Luzon, the most northern of the Philippine group, and that the Cadwallader-Gibson Company owns and operates mills there, which will assure consumers a dependable supply at all times.



BAGAC TIMBER

The framework of a new auxiliary schooner yacht building for R. Cliff Durant to the designs of Lee, Brinton and Wayland of San Francisco and Seattle at the boat building yard of J. H. Madden & Co., Sausalito, California. This framing is all of bagac, a Philippine Island timber, which, like teak, contains preservative oils making it immune to dry rot, and which on tests has shown itself to be very much stronger than the best oak.

Bagac works readily, is free from objectionable knots, and crooked grain, and should prove a very acceptable timber for the wooden hulls of yachts and work boats.

BOAT MOTORS IN AUSTRALIA

By E. G. PAULY
Assistant Trade Commissioner, Melbourne

THE sport of motor boating is experiencing a revival in Australia, and affords a good chance to develop a medium-sized market for marine motors and a somewhat smaller market for marine accessories.

Victorian waters adjacent to Melbourne are not very suitable for pleasure motor boating; but Sydney, with a landlocked harbor and numerous small bays, has every essential for the complete enjoyment of this sport. On many of these inlets wealthy local merchants have beautiful homes, an essential adjunct of which is a motorboat or sailing yacht equipped with auxiliary motor.

Of late years, practically all fishing boats have been equipped with auxiliary motors. As demand for fresh fish is increasing with the growing population, a larger number of these boats and motors should be necessary. The types of engines most favored are those up to 10 horsepower, of 2 and 4 cycles. The only outboard motors seen in Australia are of American manufacture, but their number is probably less than 100.

Distribution at present is limited to direct purchases made from the factories (where not represented here), through ship chandlers and dealers in motor cars, motorcycles, and accessories. Where agency arrangements cannot be effected with such dealers, it is suggested that manufacturers get in touch with boat builders, local fishermen's associations, motor workshops near water fronts, and local garages near coastal fishing harbors. It is recommended that no

agent be given exclusive selling rights in more than one state.

As regards marine accessories, the demand is of medium size and is supplied by local ship chandlers. There is an opening for "how-to-build" instructions, and for paper patterns for boat building up to 30 feet in length, inclusive of patterns for canoes, etc. As the sources for obtaining information along this line are not stressed in advertising, it is suggested that American manufacturers place in their advertisements in the Australian motorboat magazines the names of their foreign agents; this would save months of delay for prospective amateur builders in writing to America for particulars. (Commercial Reports.)

The jam of native boats which may be seen any morning in front of the Chinese city at Singapore

A POTENTIAL MARKET

ALL up and down the Pacific Coast of Asia and on the huge network of navigable rivers and canals tributary to that coast, there are thousands of freight and passenger boats and junks still propelled by man or wind power. These boats are heavily timbered, well constructed, and for the most part have very good underwater lines. The owners are satisfied with low speeds, and consequently a comparatively low powered and inexpensive oil or distillate power plant would have an opportunity for demonstrating economy in comparison with present methods.

Our illustration shows a small section of the jam of work boats on the river front of the Chinese city at Singapore. Every night these sampans gather, to disappear again early in the morning laden with merchandise for the Malay archipelago or go off for the day's fishing.

On the Chinese coast the opening wedge of modernization has already been driven in by a recent order from the Peking government that all vessels of 500 tons and over plying Chintse waters must be equipped with radio. While it is true that the Peking government by no means controls the Chinese coast and that few of the coast or river junks are over 500 tons, still the order indicates the trend of Chinese ideas and Pacific Coast manufacturers should keep in close touch with the possibilities in this Asiatic market.

One good feature in connection with this outlet for Pacific Coast motors is the fact that the great majority of these work boats from Soerabaya to Vladivostok are financed by Chinese bankers and hence are good pay.

A SMALL COASTWISE STEAMER

By R. Z. DICKIE

THE steamship La Feliz of the Linden Steamship Company of San Francisco is a very interesting example of adaptation to meet the demands of a growing business.

This vessel was of the well-deck type with about 80 tons capacity. She was fitted with a sincle screw, driven by a compound engine, with 10-inch and 22-inch cylinders and 12-inch stroke. The engine is well aft of amidships, and the boilers, two 60-inch diameter 9 feet long Scotch dry back, are aft of the engine. The boilers are fitted with Staples and Pfeiffer steam atomizing oil burners and are arranged for engineer control. Steam is supplied the engine at 140 pounds pressure.

Some time back the Linden Steamship Company put the La Feliz on the San Francisco-Monterey route, making the run out and back at night, loading and discharging by day, thus giving an express freight service. Demand for space soon taxed the capacity of the boat. A Cloverleaf propeller was designed specially for the job and so increased her speed as to suggest the practicability of making intermediate ports and still preserving the schedule of three round trips a week.

After thorough consideration of various methods for increasing the freight carrying capacity, E. J. Linden decided to convert the La Feliz to the flush deck type. This work has now been satisfactorily completed at Pier 23 by Benjamin Dallerup and Son. A small turbogenerator has been installed in the engine room casing to take the place of a reciprocating steam engine set and the crew's quarters have been moved from the forecastle to the after deckhouse. This work has been done under the personal supervision of E. J. Linden and of Chief Engineer Ted Markley, and the net result is that the La Feliz will now carry 135 tons of cargo. She is much improved in appearance and is a much better success financially. She makes Santa Cruz, Moss Landing, and Monterey, and is booked to capacity, giving a thoroughly satisfactory service to a large list of shippers.

TRANS-ATLANTIC TOWING

AN incident of no small interest was the feat just accomplished by the Dutch tug Jacob Von Heemskerck. In the face of sea and storm this 100-foot craft successfully towed the giant liner St. Paul from New York to Wilhelmshaven in 52 days.

The St. Paul carried a crew of twenty men, whose sole duty was to maintain and operate the steering machinery, which, even so, broke down on at least two occasions because of the hardship and stress encountered during the voyage. On one such occasion it was necessary to transfer the chief engineer from the tug to the liner to effect repairs necessary to continue the journey. Thirty days of continued vigilance and labor were required to reach the Azores, toward the end of which period the tug ran short of fuel. This necessitated casting the tow adrift, while the smaller vessel, proceeding ahead, refueled and then returned to pick up the tow again, after much difficult maneuvering.

Hardship is no new experience to Dutch tugmen, but this voyage occasioned for these seasoned veterans several new experiences. A fete and banquet were tendered these mariners upon the completion of their voyage.—(Bulletin American Bureau of Shipping.)

FAST AMERICAN MERCHANT STEAMERS

Blue Ribbon for American-Built, Privately-Owned Merchant Vessels, Held on the Pacific Coast

IN the daily press and in technical journals great space has been devoted during the past year to the discussion of the Blue Ribbon of the Atlantic and the speed records of the American passenger liners.

The trial trip of the Leviathan under Shipping Board auspices and one way records in the Gulf Stream brought back a wondrous tale of the fastest ship afloat. This largest American vessel has since her trial made one very fast passage from Cherbourgh to New York, averaging 24.17 knots an hour for the entire run.

We are all proud of the Leviathan, built in Hamburg and rebuilt at Newport News, tuned up by the best turbine experts of America. Let hed do her durndest to capture all the Atlantic Blue Ribbons. However, right here in our own little Pacific pond we have a few speed burners, and we advise the Atlantic racers to stay in their home waters if they wish to keep their blue pennants flying.

A monthly publication of the Department of Commerce, known as "American Documented Seagoing Merchant Vessels of 500 Gross Tons and Over," prints tables of tonnage, speed, home port, etc. These tables list six vessels of over twenty knots; namely:

Vessel	Speed	Home Port
City of Los Angeles	20	Los Angeles
H. F. Alexander	23	Tacoma
Harvard	22	Los Angeles
Leviathan	22	New York
Mount Vernon	22	San Francisco
Yale	22	Los Angeles

The City of Los Angeles, of course, is an error. She makes about 15 knots at sea, and while the new propelling machinery at present being installed will probably much improve her average, it is not figured to drive her above 17 knots. The Mount Vernon, in transport service, is not out after speed records.

So we come down to four commercial passenger steamers under the American flag with sea speeds of 20 knots, or better, and of these the Leviathan, run by the Shipping Board regardless of expense or profit, is hardly a commercial venture.

On this basis we hand the Pacific Coast ship operators the "Blue Ribbon" of the American merchant marine. Every privately owned American merchant vessel operating on the sea today at speeds exceeding twenty knots an hour is owned and operated on the Pacific Coast and was built in an American shipyard.

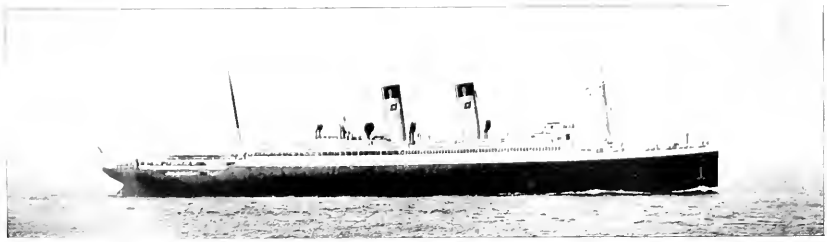
DE LAVAL TURBINE DRIVE FOR SOUTHERN PACIFIC STEAMER

(Continued from page 217)

tion at the higher pitch speeds. The main thrust bearing is of the Kingsbury type and is located on the forward end of the low speed gear. The thrust bearing is designed to handle a maximum propeller thrust of 106,000 pounds.

One important advantage of the compound type of turbine is that the width of gear face required is only one-half of that necessary where only one driving pinion is used, so that both the load on a single pinion and the length of the pinion between bearings are reduced, greatly reducing the tendency to distortion. In De Laval speed reducing gears, both gear and pinion are supported in a rigid casing in order to secure uniformity of pressure and contact under all conditions. Master gauge bars are used for scraping in the housings in which the bearings fit, and the latter are accurately ground to the seating surfaces to limit gauges to insure correct alignment and that the pinion and gear shafts are exactly parallel. Experience has proved that helical gears, which are correctly proportioned and cut and are supported in perfect alignment, will not show any appreciable wear after many years of service. Recent examination of several De Laval gears that have traveled over 500,000 miles has failed to disclose any appreciable wear, and the gears were considered by the owners to be in perfect condition.

The lubrication of gear teeth and bearings and of the turbine bearings is automatic from a gravity oiling system. A De Laval centrifugal oil purifier will be installed for removing water, sludge and other impurities from the oil. Three oil pumps, two for normal operation and one for spare, will be installed to handle the necessary oil, together with necessary overhead and drain tanks, oil cooler and strainers.



The H. F. Alexander, the fastest privately-owned American-built seagoing steamer in the American Merchant Marine

MARINE INSURANCE

THE MONTH'S DEVELOPMENTS ON THE PACIFIC COAST

By FRANCIS ADRION

THE showing made by marine companies generally during last year is now to be seen on paper. Although complete information is not yet available, it can hardly be said that we are at the close of a profitable, satisfactory year. Rather, companies operating in all lines point to their marine account as the "black sheep" from whom better reports are expected.

The element of over keen competition, which was, during the past year, the besetting evil of the business, is reflected plainly in the results of operations, and the company which has managed to preserve an even keel thus far has every reason for self congratulation.

Companies, who in 1923 willingly accepted a large decrease in premium income for the sake of conservatism, look equally bad on paper, though their affairs are in a more healthy condition than figures would indicate. This will be borne out when figures of losses incurred are available. In 1923 these companies had been paying losses consequent upon their larger operations in 1922 and years previous, and the improved condition as regards their outstanding losses and liabilities as against last year's income will not be apparent until another year has passed. On the other hand, the companies who show an increased income for 1923 not only fail to show a profit for that year, but will find it still more difficult to show one in 1924. The liability assumed by these companies has increased out of all proportion to their increased revenue and cannot but be reflected in the final analysis of their operations.

AN UNDERWRITER'S FAVORITE

The Reina Maria Cristina of the Spanish Royal Mail Line built by Denny Brothers of Dumbarton in 1888. She is still giving good service; has been in constant use in the Spain, New York, Central America, and Africa service; and has never had a serious accident. Her voyage repairs are handled by the New York Harbor Dry Dock Company.

Japanese Disaster

Sir Joseph Lowrey and Forrest E. Single, after months of strenuous labor on behalf of English and American underwriters in the devastated districts of Yokohama and Tokyo, have submitted a joint resume of the work accomplished and the conditions yet to be faced.

These gentlemen have been severely handicapped in their work by the lack of ordinary facilities which we, at home, can hardly appreciate. In addition to the fact that they have encountered the natural discomforts characteristic of a devastated area, they have been hampered by a lack of efficient clerical help. This, of course, is a most serious disadvantage in view of the nature of their endeavors.

As regards Yokohama, their reports indicate that the destruction of goods at this port was even more serious than first reports led them to expect. The area, in which cargo intended for shipment and in which inbound cargo discharged from steamers was landed and stored, was practically obliterated, the destruction being caused principally by fire.

It is pointed out in their report that, although there was serious damage to buildings in this same section as a direct result of the earthquake and in many instances the collapse of these structures must have involved damage to the goods therein, nevertheless the real destruction so far as goods are concerned was in consequence of the fire which followed.

This fact is, of course, of paramount interest to marine underwriters inasmuch as had the destruction been occasioned by earthquake only no liability would attach under the ordinary marine policy. Furthermore, though it is quite probable that in many instances the collapse of buildings really destroyed the goods involved, the fire would effectively conceal this fact.

The destruction of property in Tokyo was exceedingly large, but the interests of marine underwriters are practically limited to cargo on lighters on the way to or from Yokohama and the cargo in the custom house and sheds of the Nippon Yusen Kaisha. The loss on the outbound portion of this cargo will fall principally on Japanese underwriters.

Apparently the greatest single difficulty to be faced in passing on the validity of claims has resulted from the "warehouse to warehouse" clause in common use in policies. This applies more particularly to cargo arriving in Japan prior to the disaster.

In the case of a large quantity of cargo awaiting shipment, the position with regard to liability could be established without great difficulty. Likewise a certain amount of inbound cargo, the arrival of which antedated the loss by not more than sufficient time to permit of the customs formalities to be complied with, was also amenable to classification.

As against this, claims, large in number and amount, have been presented, in connection with which it would seem that sufficient time had elapsed since the goods were landed to complete all necessary formalities and obtain possession had the consignee shown reasonable diligence in the matter.

The investigations necessitated by these claims brought to light the fact that conditions with regard to the passing of import goods through the customs at Yokohama were and had been very bad. It was disclosed that there was no congestion at the time of the loss and that goods could be gotten through the customs in a week or ten days, unless some special question or difficulty was involved. In spite of this, a great number of consignees allege that fourteen days was about the minimum time for this to be accomplished. It would appear that in many cases the consignees used the customs godowns as convenient and economical storage for their goods when it was not convenient to them to pay the duties and take delivery.

The warehouse to warehouse clause has greatly complicated matters even where no serious delay was involved. The wording of the clause, covering as it does goods while in the ordinary course of transit, made an all important point of what the status of the goods was when destroyed.

If the consignee had no intention of removing the goods from the custom warehouse and contemplated their sale while thus held, it would appear that the goods had been "safely deposited in consignee's or other warehouse at destination" within the legal construction of the clause. The final disposition of claims coming under this category has been left to the individual insurers. The investigators have extended themselves to secure insofar as possible the consignees' positions and intentions with regard to the goods and this data will be passed on to the insurers for their guidance.

The number and amount of claims where this important point is involved was so large that opinions have been secured from legal authorities on a past decision which covered a similar case. In 1898 Justice Bigham decided under the then curent clause that "placing the goods in the customs house was a delivery to the consignees" within the meaning of the wording of the clause "until safely delivered to the consignee." This decision has never been challenged, and two of the leading legal authorities in Great Britain on marine insurance have expessed the view that the decision in question governs these cases.

The number of claims in which the damage or loss was in direct consequence of the earthquake is comparatively small and in all cases the question of liability has been left to be dealt with by the underwriters rather than the settling agents, there being apparently some difference of opinion as regards the liability in these cases. In cases where the loss was the probable result of looting, a similar course has been adopted.

The evidence presented is exceedingly contradictory, and it is hard to determine with any degree of certainty what the exact circumstances were. The report states that in some quarters it was suggested that the authorities practically told the people to help themselves, but the origin of this report was probably direct or indirect intimation, at a time when famine conditions prevailed or threatened, that foodstuffs might be taken. Apparently the situation at Yokohama was completely beyond the control of the authorities for some days and there was nothing to prevent looting of the most wholesale character. In Tykyo the military took control with promptitude and soon got the situation in hand, but Yokohama was completely cut off for some days, as the roads and railroads were blocked and there were no soldiers available on the spot. The investigators felt that the individual insurers would be best able to deal with the liability, if any, in respect of goods looted, lost or destroyed during the period when, as a result of the earthquake and fire, there was a complete loosening of all restraint.

Marine Lectures

The University of California Extension Division has made announcement of a series of lectures on the subject of marine insurance.

The lectures are to be given by James A. Quinby, J.D., of George E. Billings & Company, who has already proved his aptitude for conducting such a course. For some time past Mr. Quinby has managed the marine insurance study class fostered by the Association of Marine Underwriters of San Francisco.

The University Extension course is described as a series of ten one and one-half hour lectures devoted to a discussion of the phases of marine insurance which are most common in their application to the shipping business.

The classes will be held weekly at 237 Merchants Exchange Building, San Francisco, the first meeting being scheduled for Monday, March 24, at 7 p. m.

The lecture subjects are as follows:

Introduction to the Study of Marine Insurance.

The Contract to Insure — Warranties.

Disclosure and Representation.

Total Loss—General and Particular Average.

The Policy—The Voyage Insured.

Special Insurance.

The above announcement will, without doubt, be productive of a goodly class of prospective underwriters and shipping men generally.

It will be recalled that several years ago the University Extension Division circulated a prospectus of a similar course which was proposed to cover, at least to some extent, the same subject. This course of lectures was given under the caption Admiralty Law, its relation to Marine Insurance, and so forth. Indicating the keen interest in the subject and the desire for a better knowledge of same, the response was immediate and generous. Practically every underwriting and brokerage firm in San Francisco was represented at the initial class, in addition to a generous number of shipping men. However, it was soon disclosed that what 90 per cent of the attendance wanted — namely, some real honest-to-goodness facts about the business of marine insurance—was not to be had. I do not offer this as criticism of the course itself. The other 10 per cent of the class comprised of embryo admiralty attorneys were in their element. The course was altogether too much law; the average insurance or shipping man could not find in it a practical help for everyday use.

Now, however, the University of California Extension Division has struck the proper note. The subjects to be covered indicate their recognition of this fact, and in Mr. Quinby they have selected an instructor thoroughly competent to expound it.

Developments on the Atlantic Coast

By CHARLES F. HOWELL, Contributing Editor

UNDERWRITERS ushered in the month of March by taking important steps relative to their liability on shipments discharged from ocean liners at Yokohama, Tokyo and other ports of Japan. There had been no intimation of the heavy increase of importation into the shattered harbors of Japan; indeed, insurance men have been steadily warning against the consequences. But, in spite of all, cargo has been rushed to those destinations in quantities far exceeding the normal, and far less than normal have been the facilities for handling it. There it has accumulated, without warehouse protection, piled helter-skelter on the half-destroyed wharves, subject to wholesale pilferage and to destruction by wind, fire, rain and seas. The liability of underwriters has increased in proportion, until a point was reached where it became imperative that the extent of the coverage should be clearly and definitely defined.

Underwriters' Action

The matter was taken up by the American Institute of Marine Underwriters, and a special committee appointed to go thoroughly into the subject and report back findings and recommendations. This committee consisted of W. J. Roberts, of the Standard Marine, chairman; H. E. Manee, of Appleton & Cox; T. J. Allen, of Chubb & Son; C. L. Goldby, of William H. McGee & Company; and J. F. Purcell, of Platt, Fuller & Company. Upon the report of the committee, rendered during the closing days of February, the Institute based recommendations for action by the individual companies. A guide letter was drawn up and sent out to the Institute companies, it being understood that this should serve to direct individual action, the suggested rates and conditions being indicative of what the Institute regarded as a safe minimum. Two positions were defined: (1) That the underwriters agree, for an additional premium, to hold their assured covered on shipments discharged outside the breakwaters at Japanese ports; and (2) that, for additional premium, to be arranged, the underwriters offer to hold their assured covered for a certain number of days, as long as the goods are not yet delivered to the consignees or to the warehouses.

Early in the following week the insurance companies notified their assured of these decisions, and the New York underwriting offices communicated with their representatives in other parts of the United States and Canada, with the view of securing uniform action.

What has tended most to augment underwriting liability on Japanese shipments is the warehouse-to-warehouse clause, under which the insured is protected from the shipper's warehouse in the interior of the exporting country to the consignee's warehouse in the interior of the country of the importer. The seriousness of this extended liability, "while goods are intransit," makes doubly grave to underwriters the extraordinary state of congestion and confusion now prevailing at Yokohama and Tokyo. A special representative of the insuring companies has been on the ground for some time, and his reports have been of a character to greatly alarm the underwriters. It appears that scores of vessels are huddled in the harbor of Yokohama unable to discharge, and that scores of others are arriving with still more cargo and are obliged to lie outside the harbor. Many of the latter are discharging in lighters, which is another source

of anxiety to the insurers. Few warehouses were left intact by the Septemher earthquake, and such repairs as have been made are of indifferent value. Practically all the protecting sheds are on the extreme sea-end of the wharves, where most of the landing stages are sunk into the water which now comes right up to the sides of the sheds. In many instances the floors of these sheds are partially sunk, and high water floods them. They are piled to their roofs with merchandise The breakwater is materially sunk, and storms send the waves right over it. The season of bad weather is at hand, and a high wind or violent sea will inevitably cause thousands of dollars of damage, not only to cargo in the open, but to such as is stored in the so-called "shelter" of the dilapidated sheds.

Carriage of Vegetable Oil

Underwriters are constantly asked to cover oil in bulk, as this form of carriage is rapidly increasing, and it raises several problems of importance to insurers whose experience in handling bulk oil is necessarily limited. It has been long recognized to be advantageous to carry oil in bulk, and mineral oil has been transported in this way for some time and its problems are fairly well understood. Handling vegetable oil in the same way is something of more recent date. But it would appear to be the coming method, as leaders in the oil business state that it is by far the most economic form of transportation. From the standpoint of the underwriters bulk handling of vegetable oil is in an experimental stage, both as regards the deep tanks of regular freight steamers and tankers as well. Many ports from which the oils are shipped — in China, for instance — lack facilities for the proper cleaning and calibration of the tanks; and not until these deficiencies are corrected will insurers be willing to lend their full cooperation.

Writing Fruit in Transit

At best the coverage of fruit is a hazardous business for underwriters. It is usually insured under an all risks form at a rate of from ½ per cent to ¾ per cent, with the warranty that the fruit be sound at the commencement of the risk. Frequently a slight casualty to the vessel involves a delay, and sometimes a minor defect in the refrigerating plant will cause a heavy loss. Again, in cases where a jettison of cargo becomes necessary, the change of saving the fruit is almost negligible.

There was a recent illustration of this latter hazard in the wreck of the Atlantic Fruit liner Amelia, which stranded near Atlantic City en route from Cuba with a cargo of bananas. To lighten the vessel 20,000 bunches had to be thrown overboard. When an attempt at salvage was made it was found that the fruit had blackened and spoiled from submersion in the icy water. The loss was, of course, apportioned among all the underwriters on the vessel as a general average.

Dock Strike Hazards

Recent dock strikes at English ports and at Havana have brought to the fore the various problems of insurance against the hazards arising from such disturbances. The damage created by the former was of enormous extent, as it affected industrial conditions not alone at the home ports but throughout the world. As regards the liability of the underwriters much depends upon the adequacy of the premium rate he had the foresight to charge.

There are divergent views as to the liability of the underwriter whose policy reads:

Including [illegible] shippers' or master's [illegible] board the [illegible] quays, wharves [illegible] cause or arise [illegible] signers or their [illegible] ties.

It is contended that while the goods retain their position in the general movement of freight they

are in the ordinary course of transit and remain at the risk of the underwriter, though they lie on the docks for weeks or months subject to a length of risk never contemplated by the underwriter, especially if he has neglected to incorporate in the policy the clause:

[illegible]

On the other hand, some feel that a delay caused by the strike constitutes a stoppage in transit and relieves the underwriter from further liability. This is by no means a new problem, but, unfortunately, it does not appear to have found its way into the courts for definite adjudication.

Deterioration of perishable goods, such as fruit, due to strikes, is often one of the most prolific causes of damage claims upon underwriters. In the case of the recent English dock strikes a large shipment of apples, amounting to more than 73,500 barrels, could not be discharged, and a heavy liability was involved. Policies covering this commodity usually carry the following clause:

[illegible]

Naturally, if the vessel is safely anchored, moored or docked within the given period, the underwriter is relieved from deterioration damage, but when a strike is in progress it is highly probable that a vessel may run over its time limit, and once the door is open the underwriter may find himself covering a shipment of hard cider, if the commodity be apples, before the goods can be moved from the docks and the congestion cleared up.

New Refrigerator Service Announced

On May 1 the Cunard Line is to inaugurate a weekly refrigerator service from the St. Lawrence to Liverpool, with sailings every other Thursday afternoon from Quebec and every other Thursday morning from Montreal. This is for the accommodation of shippers of frozen and chilled meats, fruits and produce.

This will present some interesting problems to underwriters. They have had considerable experience in frozen meat coverage from South America and Australia, but the steamers of this trade are required to maintain only two temperatures: frozen meats at 8-10 degrees, and chilled meats, at 28-32 degrees. In the proposed new service the vessels will have to maintain widely different temperatures, as, for example, fish at 8-10 degrees; boxed beef at 15-18 degrees; fruit at 35-40 degrees; cured meats at 35-40 degrees; and cheese at 40-50 degrees.

For this class of business the usual coverage is at a basis rate of 2 10 per cent, subject to a charge of an additional premium, depending on the commodity, to cover loss and or damage by deterioration caused by the derangement or breakdown or latent defect in refrigerating machinery, or caused by negligence of engineers or employes.

Court Criticism of Certificates

Justice Glennon, in the New York Supreme Court, Trial Term, Part II, recently had some interesting things to say about the insurance certificate, so popular in this country for the past half-century. The suit in hand grew out of the loss of eight automobiles that were jettisoned, and which were covered by the defendant, the St. Paul Fire & Marine, under eight insurance certificates issued against an open policy. The defendant alleged, inter alia, that pursuant to the terms of the open policy, no recovery could be had against it because action was not commenced within one year from the date of the loss. This was admitted. Commenting upon this point the court observed:

"[illegible] questions in the certificate limiting the time in which an action must be commenced. While it is true that the so-called open policy, produced upon the trial by the defendant, contained such a provision, still, [illegible] the holder of the certificate to this fact [illegible] of such a limitation. There is no evidence [illegible] which indicates that the open policy had ever been in the hands of the plaintiff. [illegible] Notwithstanding that the certificate provides that the insurance is subject to the terms of the open policy, I think that a due regard for the holder's rights would require that this limitation be brought to its attention by a proper reference thereto in the certificate itself. An insurer by its conduct may waive a condition in the policy (Syracuse Lighting Co. v. Maryland Casualty Co., 226 N. Y., 251)."

Admissible Pilferage Evidence

In a recent trial before the New York Supreme Court, Appellate Term, First Department, 202 N. Y. Supp., 295, a number of important points were brought out relative to the character of evidence acceptable to the courts in cases of theft and pilferage. The judge stated that in such theft cases as this the plaintiff must prove definitely the amount of his loss in order to recover. Photostatic copies of the sales order and packing list were submitted in evidence, but the court would not accept them in the absence of proof making them complete evidence, pointing out that a photostatic copy of a document is admissible only where the original cannot be produced, or has become illegible, on proof that it is an exact copy of the original. The testimony of the plaintiff also was not acceptable in that his evidence as to the yardage of the goods was based upon "checking it," which consisted of looking at the tags on the goods and taking the markings thereon.

News in Eastern Offices

At the recent twenty-fifth annual meeting of the Atlantic Inland Association, which handles information about inland hull business, J. B. Branch was re-elected president for the twenty-second time.

Messrs. Crosby, Thayer and Brown, who have had the management and control of the insurance brokerage business of Willcox & Crosby, Inc., have acquired the minority interest held by Willcox, Peck & Hughes, Inc., and have changed the name to Brown, Croshy & Co., Inc.

A mutual insurance society has been organized in Norway for the exclusive coverage of detention caused by strikes and lock-outs.

The Northwestern Fire & Marine, of Minneapolis, has been elected to membership in the Board of Underwriters of New York.

W. J. Throckmorton, assistant manager of the Atlantic Marine Department of the Fireman's Fund, is on a business trip to the home office in San Francisco. He will return, in three or four weeks, by way of the South.

NEW FERRY STEAMER SACRAMENTO

THE passenger ferry at Sacramento, owned by the Southern Pacific Company, held satisfactory trials on San Francisco Bay, February 9. This steamer is hailed as the largest passenger ferry in the world. She was built at the West Oakland shipyard of the Southern Pacific Company, portions of the hull and machinery of the Newark being used.

The ferry is 300 feet long and has a beam of 78 feet. Her displacement is 1590 tons. The steamer is equipped with side paddle wheels 29 feet in diameter with 10-foot face.

The propelling machinery of the Sacramento is the vertical beam type, which engineers maintain is the most satisfactory type for side paddle wheel vessels. The steamer is steered by steam steering engines and is fitted with telegraphic communication between pilot house and engine room. Steering points, the first to be used on any vessel on San Francisco Bay, are also installed.

The Sacramento seats 1950 passengers and has life belt accommodations for 4000. She is furnished with a cafe tea room on the upper deck and a dining room on the main deck.

Work in Prospect

Mr. A. E. Anderson of the California Transportation Company, San Francisco, announced that plans are being prepared for submission to the stockholders for a new paddle-wheel steamer for the Sacramento river trade, the new boat to be the largest to ply the Sacramento river.

* * *

Plans are under consideration by the Dollar Line to double the passenger accommodations on the seven 502-type vessels which they are using in their round-the-world service.

* * *

Plans and specifications for a new freight steamer for the Southern Pacific Company, designed by A. S. Hebbel, superintending engineer, have been made public and bids are being made from shipyards. The Southern Pacific Company may possibly build two vessels of this type.

The steamer will be 433 feet long over all; 56 feet molded beam; 37 feet molded depth to hurricane deck; capacity 7960 deadweight tons.

* * *

An appropriation of $950,000 was approved by the House on March 19 to replace the coast guard cutter Bear, which has been in service in Alaskan waters for forty years.

* * *

The Marvin Transportation Company of Tacoma, Washington, has called for bids for a freighter designed by Captain E. J. Rathbone. The vessel will be 108 feet long, 30 feet beam, and 9 feet 6 inches depth. She will be powered with full diesel engine of 200 horsepower.

* * *

Among recommendations made by the House Appropriations Committee the first of March is a sum of $13,850,622 to enable the Coast Guard Service to recondition twenty destroyers and buy 323 fast motor boats for use against rum runners.

IN PACIFIC COAST SHIPYARDS

SHIP REPAIRING
SHIP BUILDING
RECONDITIONING
ENGINE REPAIRS

Recent Contracts

Marine Construction Co., Seattle, Wn., will build four large barges for the Army Engineers to be used on the Coos Bay jetty work. The barges will cost $9921 each.

St. Helens Shipbuilding Co., Portland, Ore., has an order for a stern-wheel river boat to be 155 feet long and 35 feet beam.

W. F. Stone & Son Shipbuilding Co., Oakland, Calif., has two new orders; one is for a tugboat for the Daniel Contracting Co., San Francisco, 65 feet long, 17 feet beam, 8 loaded draft, powered with 150 horsepower diesel engines; the other is for a barge for the Naknek Packing Co.

American Bridge Co., Pittsburgh, has a contract from the U. S. Engineers, Florence, Ala., for eight barges, 120 by 30 by 7 feet. This company also has an order for fifteen barges for the American Steel & Wire Co., Pittsburgh, 100 by 26 by 9-3 feet.

Bethlehem Shipbuilding Corp., Harlan, Plant, Wilmington, Del., has been awarded contract for the construction of two carfloats for the Central Railroad of New Jersey, 325 feet long, 38 feet 6 inches beam, to cost $199,000.

Great Lakes Engineering Works, Ashtabula, O., has received contract for two dump scows for the Great Lakes Dredge & Dock Co., 181 feet long, 40 feet beam, 12 loaded draft, with 1000 yards capacity.

Howard Shipyards & Drydock Co., Jeffersonville, Ind., will build two ferryboats for the Algiers Public Service, Inc., 1 Canal street, New Orleans. The ferryboats are to be 150 feet 6 inches long and will cost $135,973 each.

Midland Shipbuilding Co., Midland, Ontario, will build a bulk freighter for the Great Lakes Transportation Co. The steamer will be 560 feet over all, 60 feet beam, 20 feet 6 inches loaded draft, and will have a carrying capacity of 12,000 tons.

Nashville Bridge Co., Nashville, Tenn., has orders for two deck barges; one for T. L. Herbert & Sons and one for the Greenville Stone & Gravel Co.

Keel-layings

Combination steamer for Southern Pacific Co., Todd Drydock & Construction Corp., Tacoma, Wn., Feb. 26.

Six oil barges for Standard Oil Co. (N. J.), Bethlehem Shipbuilding Corp., Sparrows Point Plant; three on Feb. 11 and three on Feb. 15.

Bulk freighter, Franklin Steamship Co., Great Lakes Engineering Works, Feb. 25.

Deck barge for T. L. Herbert & Son, Nashville Bridge Co., Feb. 27.

Yacht, Aaron De Roy, De Foe Boat & Motor Works, Bay City, Mich., Mar. 5.

Launchings

Steel oil barge, Shell Oil Co., Bethlehem Shipbuilding Corp., San Francisco, Mar. 5.

Dan F. Hanlon, steel lumber schooner, Hanlon Drydock & Shipbuilding Co., for Dan F. Hanlon, Mar. 17.

Henry Ford II, bulk freighter, Ford Motor Co., American Shipbuilding Co., Lorain, O., Mar. 1.

Two army barges, Bethlehem Shipbuilding Corp., Harlan Plant, Feb. 2.

Flat scow, M. Sullivan, Great Lakes Engineering Works, Mar. 8.

Tugs C and D, U. S. Engineers, Spedden Shipbuilding Co., Feb. 25 and Mar. 5.

C. B. Harris, pipe line dredge, U. S. Engineers, Chas. Ward Engineering Works, Feb. 21.

Deliveries

Light vessel 107, Dept. of Commerce, Bath Iron Works, Bath, Me., Feb. 24.

Army barge, Bethlehem Shipbuilding Corp., Harlan Plant, Feb. 16.

J. H. Senior, oil tank barge, Standard Oil Co. (N. J.), Newport News Shipbuilding Co., Feb. 22.

Arthur N. Herron, tug, American Dredging Co., New York Shipbuilding Corp., Feb. 24.

Repair Award

The most important contract awarded to a Pacific Coast shipyard during the past month went to the Union Plant of Bethlehem Shipbuilding Corp., San Francisco. This was the overhauling and general reconditioning of the steamer Sierra, ex Gdansk, for the Oceanic Steamship Company, who recently purchased the vessel on the East Coast. Bids submitted for this work were as follows: Bethlehem, $209,997, seventy-three days; Moore Drydock Co., $224,971, ninety days; General Engineering Co., $229,500, sixty days. The specifications call for enlarging the cabin accommodations and making all one-class cabins, overhauling machinery, and general reconditioning.

Shipyard Notes

The steamer Emma Alexander, ex-Nanking, ex-Congress, was put into the Pacific coastwise service of the Admiral Line early in February. The vessel was reconditioned by Todd Drydock & Construction Corp. at Tacoma and has taken her former place among the best equipped and most comfortable steamers on the Pacific.

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Walter Scammell has been appointed San Francisco agent for the Winslow Marine Railway & Shipbuilding Co. of Seattle.

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(Continued on page 64, Ad Section)

NEW FERRY STEAMER SACRAMENTO

THE passenger [illegible] ramento, [illegible] ern Pacific [illegible] [illegible] Bay Ferr[illegible] er is hailed as the [illegible] ferry in the world. [illegible] at the West Oakland [illegible] the Southern Pacific [illegible] tons of the [illegible] the Newark [illegible]

The ferry is 300 feet [illegible] a beam of 78 feet. Her [illegible] is 1500 tons. The [illegible] equipped with side paddle [illegible] feet in diameter with [illegible]

The propelling [illegible] Sacramento is the [illegible] type, which engineers [illegible] the most satisfactory [illegible] paddle wheel vessel. The [illegible] is steered [illegible] and is fitted with [illegible] engine room. Steering [illegible] first to be used [illegible] San Francisco Bay.

The Sacramento [illegible] sengers and [illegible] for 4000 [illegible]

IN PACIFIC COAST SHIPYARDS

SHIP REPAIRING
SHIP BUILDING
RECONDITIONING
ENGINE REPAIRS

W[illegible] Prospect

[illegible] molded depth to hurricane deck; [illegible] 7960 deadweight tons.

◆ ◆ ◆

[illegible] appropriation of $950,000 was [illegible]ed by the House on March 19 [illegible] building of a vessel to re[illegible] the coast guard cutter Bear, [illegible] has been in service in Alas[illegible] waters for forty years.

[illegible] Marvin Transportation Com[illegible] Tacoma, Washington, has [illegible] bids for a freighter de[illegible] Captain E. J. Rathbone. [illegible] will be 108 feet long, 30 [illegible] and 9 feet 6 inches depth. [illegible] be powered with full diesel [illegible] 200 horsepower.

[illegible] recommendations made by [illegible] Appropriations Commit[illegible] first of March is a sum of [illegible] to enable the Coast Guard [illegible] recondition twenty de[illegible] and buy 323 fast motor [illegible] use against rum runners.

IN PACIFIC C AST SHIPYA DS

SHIP REPAIRING
SHIP BUILDING
RECONDITIONING
ENGINE REPAIRS

Recent Contracts

Marine Construction Co., ttle, Wn., will build four large ba for the Army Engineers to be on the Coos Bay jetty work. Th ges will cost $9921 each.

St. Helens Shipbuilding Co ort- land, Ore., has an order for rm- wheel river boat to be 155 f ong and 35 feet beam.

W. F. Stone & Son Ship ling **Co.,** Oakland, Calif., has new orders; one is for a tugboat the Daniel Contracting Co., Sa an- cisco, 65 feet long, 17 feet n, S loaded draft, powered w 150 horsepower diesel engines; t her is for a barge for the Nak ack- ing Co.

American Bridge Co., Pit rgh, has a contract from the U. ngi neers, Florence, Ala., f ight barges, 120 by 30 by 7 fe This company also has an orde lit- teen barges for the Ameri steel & Wire Co., Pittsburgh, 1 26 by 9-3 feet.

Bethlehem Shipbuilding Co Har- lan, Plant, Wilmington, has been awarded contract for con struction of two carfloats the Central Railroad of New Je 325 feet long, 38 feet 6 inches n, to cost $199,000.

Great Lakes Engineering orks, Ashtabula, O., has received tract for two dump scows for t Great Lakes Dredge & Dock Co., feet long, 40 feet beam, 12 load draft, with 1000 yards capacity.

Howard Shipyards & Dry Co., Jeffersonville, Ind., will b two ferryboats for the Algier ublic Service, Inc., 1 Canal stre New Orleans. The ferryboats o be 150 feet 6 inches long and cost $135,973 each.

Midland Shipbuilding Co. Mid- land, Ontario, will bui bulk freighter for the Great Lakes ans- portation Co. The steamer be 560 feet over all, 60 feet be 20 feet 6 inches loaded draft, a will have a carrying capacity o 12,- 000 tons.

Nashville Bridge Co., Nas Tenn., has orders for two barges; one for T. L. Herbert Sons and one for the Greenv Stone & Gravel Co.

Keel-layings

Combination steamer for Southern Pacific Co., Todd Drydock & Construction Corp., Tacoma, Wn., Feb. 26.

Six oil barges for Standard Oil Co. (N. J.), Bethlehem Shipbuilding Corp., Sparrows Point Plant; three on Feb. 11 and three on Feb. 15.

Bulk freighter, Franklin Steamship Co., Great Lakes Engineering Works, Feb. 25.

Deck barge for T. L. Herbert & Son, Nashville Bridge Co., Feb. 27.

Yacht, Aaron De Roy, De Foe Boat & Motor Works, Bay City, Mich., Mar. 5.

Launchings

Steel oil barge, Shell Oil Co., Bethlehem Shipbuilding Corp., San Francisco, Mar. 5.

Dan F. Hanlon, steel lumber schooner, Hanlon Drydock & Shipbuilding Co., for Dan F. Hanlon, Mar. 17.

Henry Ford II, bulk freighter, Ford Motor Co., American Shipbuilding Co., Lorain, O., Mar. 1.

Two army barges, Bethlehem Shipbuilding Corp., Harlan Plant, Feb. 2.

Flat scow, M. Sullivan, Great Lakes Engineering Works, Mar. 8.

Tugs C and D, U. S. Engineers, Bedden Shipbuilding Co., Feb. 25 and Mar. 5.

C. B. Harris, pipe line dredge, U. S. Engineers, Chas. Ward Engineering Works, Feb. 21.

Deliveries

Light vessel 107, Dept. of Commerce, Bath Iron Works, Bath, Me., Feb. 24.

Army barge, Bethlehem Shipbuilding Corp., Harlan Plant, Feb. 16.

J. H. Senior, oil tank barge, Standard Oil Co. (N. J.), Newport News Shipbuilding Co., Feb. 22.

Arthur N. Herron, tug, American Dredging Co., New York S Drydock Corp., Feb. 24.

Repair Award

The most impo d to a Paci g the past on Plant g Corp.,

the overhauling and general reconditioning of the steamer Sierra, ex Gdansk, for the Oceanic Steamship Company, who recently purchased the vessel on the East Coast. Bids submitted for this work were as follows: Bethlehem, $209,997, seventy-three days; Moore Drydock Co., $224,971, ninety days; General Engineering Co., $229,500, sixty days. The specifications call for enlarging the cabin accommodations and making all one-class cabins, overhauling machinery, and general reconditioning.

Shipyard Notes

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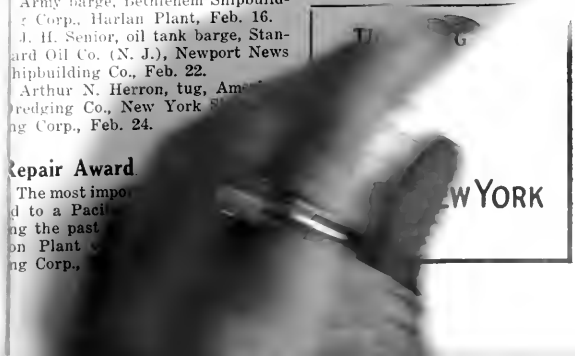
(Continued on page 64, Ad Se



Progress in Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT
Potrero Works

Purchasing Agent: O. W. Streett.

Hull 5319, steel barge, Shell Oil Co.; 140 LB P; 26 molded beam; 14 molded depth; keel Dec 20/23; launched Mar5 24.

Hull 5326, sister to above; keel Dec27/23; launch Mar15/24, est.

HANLON DRYDOCK & SHIPBUILDING COMPANY
Oakland, Calif.

Purchasing Agent: R. Barker.

Dan F. Hanlon, hull 89, steam schr D. J. Hanlon; 2500 DWT; 1400 IHP engines; 2 B&W boilers; launched Mar17 24.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
San Pedro, Calif.

Catalina, hull 42, excursion stmr, Wilmington Transp. Co.; 285 LBP; 52 beam; 14 loaded draft; 16 loaded speed; twin screw 3-cyl TE engs, 3600 IHP; 4 B&W boilers; keel Dec26/23; launch May1/24, est; deliver July1 24, est.

NAVY YARD
Puget Sound

Medusa, repair ship for government; 460 LBP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng, 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan 20, launched Apr16 23; deliver May15/24, est.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons disp; keel Apr11 23; delivery Apr 25, est.

JAS. ROBERTSON SHIPYARD
Alameda, Calif.

Ferryboat, double-end side-wheeler, Richmond-San Rafael Ferry Co.; 172 LBP; 38 beam; 9 loaded draft; 12 knots speed; 700 IHP cross comp engs; 2 dry back boilers, 9-2; keel Dec10 23; launch Apr21 24, est; deliver May20 24, est.

W. F. STONE & SON SHIPBUILDING COMPANY
Oakland, Calif.

Olive, hull 51, yacht, for F. A. Hyde; 50 LBP; 14 beam; 6 loaded draft; deliver May 1 24, est.

No name, hull 52, tug, Daniel Const. Co.; 65 LBP; 17 beam; 8 loaded draft; 150 IHP diesel eng; deliver May1 24, est.

Hull 53, barge, Naknek Packing Co.; 65 LBP; 24 beam; deliver Apr1 24, est.

PRINCE RUPERT DRY DOCK & SHIPYARD
Prince Rupert, B. C.

Two cruiser hulls, 60 ft, for Dominion government Fisheries Service; deliver Mar30/24, est.

TODD DRYDOCK & CONSTRUCTION CORPORATION
Tacoma, Wash.

Six steel barges, hulls 37-42 inc., U. S. Engineers, Portland; 120x34x7-6 feet; launch Apr1/24, est.

No name, hull 43, passenger and freight stmr, Southern Pacific Co.; 445 LOA; 57 beam; 25 loaded draft; 16 knots speed; 7000 DWT; keel Feb26 24.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Forty coal barges, Carnegie Steel Co.; 175 long by 26x11; 35 delivered

Twenty coal barges, Carnegie Steel Co.; 175x 26x11; deliver spring 1924.

Nineteen barges, U. S. Engineers, Louisville, Ky.; 110x26x6-6; deliver July 24, est.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft; deliver 1924, est.

Sixteen barges, U. S. Engineers, Louisville; 110x26x6-6; deliver Oct1 24, est.

Eight barges, U. S. Engineers, Florence, Ala.; 120x30x7; deliver July and Aug/24.

Fifteen barges, Amer. Steel & Wire Co., Pittsburgh; 100x26x9-3; deliver 1924.

THE AMERICAN SHIP BUILDING COMPANY
Lorain, Ohio

W. H. Gerbauser, vice-president and director of purchases.

Greater Detroit, hull 785, paddle stmr, Detroit & Cleveland Nav. Co.; 535 LBP; 98 beam; 16 loaded draft; 20 mi loaded speed; 3 cyl comp engs, 10,000 IHP; 6 SE and 3 DE Scotch boilers, 14x20; keel Feb10/23; launched Sept14/23; deliver spring 1924.

Greater Buffalo, hull 786; sister to above; keel May2 23; launched Oct27/23.

Henry Ford II, hull 788, bulk freighter, Ford Motor Co.; 590 LBP; 62 beam; 20 loaded draft; 13 loaded speed; 12,000 DWT; 3300 IHP; Doxford diesel engs; keel Dec10/23; launched Mar 1 24.

BATH IRON WORKS, LTD.
Bath, Maine

Purchasing Agent: J. L. P. Burke.

Light vessel 107, hull 87, second-class light vessel, U. S. Dept. of Commerce; 109-6 LBP; 30 beam; 14-4 loaded draft; 9½ speed; comp eng; 400 IHP; 2 Scotch boilers, 10-6x11-5; keel Apr14/22; launched Dec8 23; delivered Feb24/24.

Light vessel 111, hull 92, sister to above; hull only; keel Aug21/23.

Aras, hull 96, yacht for Hugh J. Chisholm; 118-4 LBP; 18-6 beam; 5-6 loaded draft; 15 mi loaded speed; two 6-cyl gas engs, total 111P 400; keel Dec1/23; launch May17/24, est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT
Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N. Massachusets, hull 1400, battleship U.S.N.; to be scrapped.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT
Wilmington, Del.

Hull 3486, army barge, U.S. Army; keel Sept 24 23; delivered Feb16 24.

Hull 3487, army barge U.S. Army; keel Nov10 23; launched Feb2 24.

Hull 3490, U. S. Army; keel Dec8/23; launched Feb2 24.

Hull 3490, carfloat, C. R. R. of N. J.; 325 LB P; 38-6 beam; 1030 gross tons.

Hull 3491; same as above.

BETHLEHEM SHIPBUILDING CORPORATION, SPARROWS POINT PLANT
Sparrows Point, Md.

Alexander Hamilton, hull 4217, passenger vessel, Hudson River Day Line; 325 LBP; 76 beam over guards; 13-8 deep; 1 TE eng, inclined, 3500 IHP; 2 single and 2 double ended boilers; keel Apr2 23; launched Oct20 23.

Boston, hull 4218, passenger vessel Eastern Steamship Co.; 385 LBP; 72-6 beam; 23-9 molded depth; twin screw turbine engs, 6400 HP; 6 Scotch boilers; keel Mar13 23; launched Oct27/23; deliver Apr15 24, est.

New York, hull 4219, sister to above; keel Apr3 23; launched Jan12 24; deliver May 15, 24, est.

Hull 4222, oil barge, Standard Oil Co. (N. Y.); 136 LOA; 23 molded beam; 5-6 depth; keel Feb 11/24.

Hull 4223, sister to above; keel Feb11 24.

Hull 4224, sister to above; keel Feb11 24.

Hull 4225, sister to above; keel Feb15 24.

Hull 4226, sister to above; keel Feb15 24.

Hull 4227, sister to above; keel Feb15 24.

Hull 4228, barge, Hudson River Day Line; 100x18x16 ft.

Hull 4229, sister to above.

CLINTON SHIPBUILDING & REPAIR COMPANY
Philadelphia, Pa.

No name, hull 45, oil barge, City of Phila.; 88 LBP; 30 beam; 8 loaded draft; keel June /24, est; launch July/24, est; deliver Aug 24, est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Wig Wag, hull 2744, D cruiser, U. S. Borden; 62x10-6; speed 30 mi., two 300 HP Speedway engs.

Hulls 2746-50, inc, stock; 34x8-6; hulls only; 3 delivered.

Klaklanee, hull 2752, tender, L. M. Wainwright, same as above.

Hulls 2755-56, 26-ft tenders for Cox & Stevens.

Hull 2757, runabout, Sidney A. Smith; 60 HP Speedway engs.

COLLINGWOOD SHIPBUILDING COMPANY
Collingwood, Ontario

No name, hull 73, bulk freighter, Matthews Steamship Co.; 536-6 LBP; 58 beam; 31 molded depth; 13,000 DWT; 13 mi. loaded speed; 2400 h.p. TE engs; 3 Scotch boilers, 14-1 p.; keel Dec31/23.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.
Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.

Trenton, hull 503, scout cruiser, U.S.N.; keel Apr18 20; launched Apr16 23; 94.9 per cent comp Mar1 24.

Marblehead, hull 502, scout cruiser, U.S.N.; keel Apr4 20; 77 per cent comp Mar1 24; launched Oct9 23.

Memphis, hull 503, scout cruiser, U.S.N.; keel Oct4 20; 67 per cent comp Mar1 24.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

No name, hull 61, yacht, builder's account; 98 LBP; 15 beam; 6 draft; 14 speed; Standard gas engine; keel June 28 22; launched Aug 6/23; delivery June1 24, est.

Reomar III, hull 70, R. E. Olds, 100 LBP; 18-6 beam; 4 loaded draft; diesel eng, 250 IHP; keel Sept1 23; launched Nov15 23; deliver June 1 24, est.

Two steel car floats, Erie R. R.; 186 long; 34 beam; 8 depth; launch Apr12 24, est; deliver Apr15 24, est.

No name, hull 73, yacht, Aaron De Roy; 62 LBP; 13-6 beam; 4 loaded draft; 160 IHP gas engs; keel Mar5 24; launch June25 24, est; deliver July15, 24, est.

DRAVO CONTRACTING COMPANY
Pittsburgh, Pa.

Hull No. 171, steel barge, U.S. Engineers, 400 gross tons.

Hulls Nos. 263-281, 2 steel sand and gravel barges, builder's account; 135 gr. ss tons.

Hulls 282-285, inc, 4 steel dump scows, builder's account.

Hulls 293-306, inc, 14 steel barges, Mississippi River Commission, Memphis; 630 gr ss tons each.

Hulls 307-312, inc, 6 steel dump scows, U.S. Engineers, Louisville; 127 tons each.

Hull 317, derrick boat, U.S. Engineers, Huntington, W. Va.; 100 gross tons.

Hull 318, steel hull for sand dredge; Mississippi River Commission, Memphis; 75 gross tons.

Hulls 319-327, inc, 9 steel derrick boat hulls; 115 gross tons each; for U.S. Engineers, Louisville, Ky.

Hulls 330-331, 2 steel sand and gravel barges, Empire Limestone Co., Buffalo.

Hull 332, steel barge, U.S. Engineers, New Orleans; 120x30x7; 430 tons.

Hull 333, sand digger, Ohio River Sand Co., Louisville; 155x42x7-6; 430 tons.

Hull 334, sand digger, Keystone Sand & Supply Co.; 155x42x7-6; 430 tons.

Hull 335, steel work boat, Second Pool Coal Company.

DUBUQUE BOAT & BOILER WKS.
Dubuque, Iowa

Hulls 76 to 74, inc, oil barges, U.S. Engineers, Rock Island, 100 LBP; 30 beam; 6 loaded draft.

Hulls 75-76, 2 oil barges, U.S. Engineers, Cincinnati, 100 LBP; 30 beam; 6 loaded draft.

Hull 77, hull for towboat, U.S. Engineers, Nashville; 90 LBP; 20 beam; 4-6 loaded draft.

FEDERAL SHIPBUILDING CO.
Kearny, N. J.

Purchasing Agent: R. S. Page.

Hull 78, oil barge, Seaboard Shipping Co.; keel Jan26 24.

Hull 79, steel oil barge, Mexican Pet. Co.

Hull 80, sister to above.

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent Chas. Sharp.

Hull 245, bulk freighter, Ford Motor Co.; 586 LBP; 62 beam; 20 loaded draft; 13 mi speed; 13,500 DWT; 3300 IHP Doxford engs; keel Nov26 23; launch April5 24, est.

Hull 246, flat scow, M. Sullivan, Detroit; 111 x30x6 feet; launched Mar8 24.

Hull 247, bulk freighter, H. K. Oakes, Frankenstein S. S. Co., Cleveland; 612 LOA; 586 LBP; 62 beam; 32 depth; 20-1 laded draft; 13,500 DWT; 12 mi speed; keel Feb25 24; deliver Oct 1 24, est.

GREAT LAKES ENGINEERING WORKS
Ashtabula, Ohio

Hull 318, dump scow, Great Lakes Dredge & Dock Co.; 181 LOA, 40 beam; 12 loaded draft; 3400 yards capacity; keel Mar13 24, est; launch May15 24, est; deliver June1 24, est.

Hull 548, [illegible] launch Mar[illegible]24, est; launch Mar[illegible] 24, est; deliver June[illegible] est.

HOWARD SHIP YARDS & DOCK COMPANY
Jeffersonville, Ind.

Purchasing Agent: Jas. I. Howard.

Steel tow boat; 140 long, 32 beam, 6-ft. depth hold.

Two steel river boats, U. S. government.

No name, Algiers Public Service, Inc., New Orleans, 150 feet 6 inches long.

No name, ferryboat, sister to above.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Pere Marquette 21, hull 209, car ferry, Pere Marquette Ry. Co.; 348 LBP, 56 beam, 16 loaded draft; 14 mi loaded speed, 2 sets TE engs, 2750 total IHP, 4 Scotch boilers, 14x68-11; 18 lbs. steam; keel Oct[illegible]23, launch Mar[illegible] 24, est.

Pere Marquette 22, hull 210, sister to above; keel Dec[illegible]23, launch Jan[illegible]24, est.

Hull 211, steel barge, War Dept., U. S. gov.; 175 ft long, 40 ft molded beam, 11 ft 6 in molded depth; keel March[illegible]24, est.

Hull 212, steel tug, Great Lakes Dredge & Dock Co., Chicago; 75 ft long, 23 ft molded beam; 11 ft molded depth; 900 IHP Fairbanks-Morse 600 engs; keel Jan[illegible]24, launch Mar[illegible] 24, est.

Hull 213, sister to above; keel Jan[illegible]24; launch Mar[illegible]24, est.

MARIETTA MANUFACTURING CO.
Point Pleasant, W. Va.

Sabot, hull 137, towboat, Jones & Laughlin Steel Corp.; 165 LBP, 36 beam, 7.6 depth, 105 gross tonnage, 16x28-in. Laughlin comp. engs, western river return tubular boilers; keel Oct. 1,23, launch Feb.23, est, deliver Feb.24, est.

No name, hull 138, sister to above.

MIDLAND BARGE COMPANY
Midland, Pa.

Lousville, hull 12, side wheel, Louisville & Cincinnati Packet Co., Cincinnati, 148 283 LBP; 80 beam; 700 IWI. launched Dec 23, deliver April 24, est.

Hull 32, maneuver boat hull, U.S. Engineers, Huntington, W. Va.; 60 LBP, 36 beam, 83 DW T; keel June 23, launch March 24, est; deliver April 24, est.

Hull 33, derrick boat hull, U.S. Engineers, Mobile; 80 LBP, 34 beam, 105 DWT; keel Feb 1 24, launch May 1 24, est; deliver April 24, est.

Hull 34, sand and gravel barge, E. T. Slider Co., New Albany, Ind.; 176 LBP; 40 beam; 400 DWT; keel Feb[illegible]24, launch April[illegible]24, est; deliver May[illegible]24, est.

MIDLAND SHIPBUILDING CO.
Midland, Ontario

No name, hull 36, freighter, Great Lakes Transit Co.; 560 LBA; 60 beam, 29.6 draft; Scotch boilers.

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Leo E. Wise.

Hulls 12-64, barges for U.S. govt.; 200 LBP, 26 beam, 4 loaded draft; keels March 4, est; delivery May[illegible]24, est.

No name, hull 67, dredge, W. F. Harbison & Co.; 110 LBP, 30 beam, 6 loaded draft; keel May[illegible]24, est; deliver June[illegible]24, est.

Hulls 36-71, ore carriers, U.S. Engineers, Cincinnati; 40 LBA; 12 beam, 5 loaded draft; keels May 24, est.

Hull 76, deck barge, U.S. govt., Evansville, Ind.; 52 LBP, 16 beam, 3 loaded draft; keel[illegible]24, est.

Hull 77, sister to above; keel May 24, est.

Hull 78, deck barge, T. L. Herbert & Son, 100 LBP, 22 beam, 3 loaded draft; keel Feb 27 24, deliver May 24, est.

Hull 79, deck barge, Greenville Stone & Gravel Co., 120 LBP, 30 beam, 7 loaded draft; deliver June[illegible]24, est.

NAVY YARD
Boston, Mass

Whaleback tender tender No. 4, U.S. Navy; 300 LBP, 41 beam, 22 loaded draft, 16 knots; loaded displ., 4,[illegible]00 tons; 1,[illegible]00 SHP geared turbines; 2 WT express type boilers; keel No.[illegible]; launched[illegible]22, delivered May[illegible]

NAVY YARD
Philadelphia, Pa.

[illegible] repair to hull, U.S.N.; 440 LBP, [illegible] beam, 16 loaded draft; [illegible] displ., [illegible] tons; 8,000 SHP geared turbine engs; [illegible] WT boilers; keel[illegible]; launched[illegible]22; delivered July [illegible]24.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, W. Va.

Purchasing Agent: Jas. Plummer, 232 Broadway, New York City.

L. H. Senior, hull 273, oil tank barge, Standard Oil Co. (N. J.); 210 LBP, 38 beam, 16-6 depth; 9 loaded speed; capacity 11,000 barrels; McIntosh & Seymour diesel engs., 435 HP Westinghouse motor; keel Oct.22,23, launched Jan 5 24; delivered Feb.22 24.

No name, hull 276, freight and passenger steamer, Old Dominion Steamship Co.; 375 ft LBP, 53 beam; 29.0 depth; speed 16 knots; 2100 IHWT, Newport News Curtis turbines, 4750 SHP, B & W boilers; keel Mar.24, est.

No name, hull 277, sister to above; keel Apr 24, est.

NEW YORK SHIPBUILDING CORP.
Camden, N. J.

Purchasing Agent: I. G. Buckwalter.

No name, hull 265, bulk oil stock; 419-8 LB P, 56-3 beam, 25-9; loaded draft, 30-3; loaded speed, 9 knots; DWT, 13,[illegible]; TE engs, 3000 SHP; 3 SE Scotch boilers, 15 10x11-4; keel Feb.28 23; launch Mar.24, est; deliver Apr.24, est.

Arthur N. Herron, hull 279, tug, American Dredging Co., Philadelphia; 500 BHP; Winton diesel engs; keel Sept.23; launched Nov.26 23, delivered Feb.24.

Hulls 280-289, ten carfloats, Pennsylvania R. R. Co.; 290 ft long; 2 tracks; 9 delivered.

Hull 290, self-propelled oil barge for Standard Transp. Co.; 260 40x14 feet; 2 350 BHP diesel engs; keel Dec[illegible]23; deliver spring 24.

Hull 291, sister to above; keel Dec.20 23.

Hull 292, sister to above; keel Dec.27 23.

SPEDDEN SHIPBUILDING CO.
Baltimore, Md.

Purchasing Agent: W. S. Calhoun.

Tug X, hull 255, U.S. Engineers, Philadelphia; 50 LBP; 14 1/2 beam; 5 loaded draft; 11 DW T; 100 IHP Manns engs; launched Jan[illegible]24; delivery March[illegible]24.

Tug R, hull 256, sister to above; launched Jan.28 24, deliver April 24, est.

Tug O, hull 257, sister to above; launched Feb 25 24, est.

Tug D, hull 258, sister to above; launched Mar5 24.

STATEN ISLAND SHIPBUILDING COMPANY
Staten Island, N. Y.

Purchasing Agent: R. C. Mills.

No name, hull 749, steel diesel electric tug boat, Penn. R. R. Co.; 105 LBP, 24 beam, 13-6 loaded draft.

No name, hull 750, steel diesel electric tug boat, Atlantic Refining Co.; 94 LBP, 23 beam, 11-5 loaded draft.

No name, hull 771, sister to above.

No name, hull 772, sister to above.

SUN SHIPBUILDING COMPANY
Chester, Pa.

Purchasing Agent: H. W. Scott.

A. MacKenzie, hull 58, hopper dredge, U.S. Engineers; 234 LBP; 46 beam; 19-6 molded depth; 12-6 loaded draft; 2000 IHWT, diesel-electric engs.; keel March 23, launched Nov.20 23; deliver Feb.20 24, est.

J. L. Marshall, hull 59, sister to above; keel March 26 23, launched Nov.20 23, deliver Mar. 20 24, est.

Dan C. Kingman, hull 60, sister to above; keel June 18 23, launched Feb 25 24, est.

Wm. J. Rossell, hull 61, sister to above; keel June 23 23; launch March 24, est.

Schenectady, Sarona, hull 73, motor barge, Standard Oil Co.; 250 LOA, 36 beam, 14 depth; 2 880 BHP diesel engs; keel Dec.23 23, Amsterdam, hull 74, sister to above; keel Dec. 23 23.

Rome, hull 75, sister to above; keel Dec.23 23.

Oswego, hull 76, sister to above; keel Dec. 23 23.

Burlington, hull 77, sister to above; keel Dec. 23 23.

Hull 78, oil barge, Sun Oil Co.; keel Jan[illegible]24.

Hull 79, oil barge, N. Y. Central R. R. Co.; 144 LBP, 27 beam, 11-6 depth; 1100 IHWT; keel Jan[illegible]24.

No name, hull 80, oil barge, Tidewater Oil Co.; 96 ft long, 32 ft beam, 10 ft depth; keel Feb[illegible]24, launch Mar[illegible]24, est.

THE TOLEDO SHIPBUILDING CO.
Toledo, Ohio

Purchasing Agent: H. M. Ives.

William A. Field, hull 176, bulk freighter, U.S. Rolling Stock Co., Sheboygan, Wisc.; 600 LBP, 60 beam, 30 loaded draft; 13,[illegible] loaded speed; 7000 IHWT, triple exp., 2500 IHP, 3 Scotch boilers, 14 ft; keel June[illegible]23, launched Jan[illegible]24, deliver April 24, est.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Greenbrier, hull 21, U.S. Lighthouse tender, 164-6 long, by 32-6 by 5-2; non condensing IHP engs, 15 inch diam cylinder, 34-in stroke; 3 Mississippi River type boilers, 26 ft long, coal burning, natural draft; keel June26,23; launched Nov13,23; deliver Mar29/24, est.

C. B. Harris, hull 31, 24-in pipe line dredge, U.S. Engineers, Cincinnati, O.; 175 long by 50 by 8[illegible]; pumping engs, 1000 BHP McIntosh & Seymour diesel, 2 aux 225 BHP McIntosh & Seymour engines; keel Sept20,23; launched Feb 21 24, deliver July1/24, est.

Tacoma, hull 32, steel hull, Cincinnati Pomeroy & Charleston Packet Co., Cincinnati, O.; 190 long by 37 by 6; keel Jan17,24; launch April 24, est.

Lookout, hull 33, towboat, U.S. Engineers, Nashville, Tenn.; 116 ft long; 29 ft beam; 5-6 depth; 2 surface condensing tandem comp engs, 500 IHP; 1 watertube boiler; coal burning; natural draft; keel April 24, est.

Repairs

BETHLEHEN SHIPBUILDING CORPORATION, LTD.
UNION PLANT
San Pedro Works

Drydock, clean, paint, misc. repairs: Lebec, T. H. Wheeler, Diana Dollar. Renew portion of planking: Barge No. 97. Renew plates, misc. repairs: Agwimoon.

Potrero Works, San Francisco

Drydock, paint, misc.: Ohioan, City of Para, Hawaiian, Mojave, Minnesotan, Admiral Schley, Tuscaloosa, Makiki, Georgian, Catherine Donovan, Ishpeming, City of Papeete, Mary E. Moore, Santa Paula, Nebraskan, President Lincoln, Meteu, Fred C. Meyer, Maui, Admiral Peary, Engine, boiler and hull: Tejon. Drydock, misc.: Rotarian. Drydock, paint: Oxford, Arizonan. Install oil burner system: Tenyo Maru. Hull repair: Trinidad, La Placentia, San Pedro, Hugoton, Hagerup, San Pedro Culebra, Emma Alexander, Matsonia, Minnesotan, Olinda, Ecuador. Engine repairs: Mojave, J. A. Moffett, Canoubia, Los Alamos (also hull). Propeller repairs: J. A. Warner, Manna, Ah, Meteu, Santiam, Hammond Lumber Co. #4, B. Stinson, Daisy Gray, Manukan. Pump repairs: Montebello, Oakland, Cape Ann, Richmond, Admiral Rogers, Butler, Salem Sun. 24 positive air control units: Golinck Regulator Co. generator: Manukan. Misc.: Capt. A. F. Lucas, Oleum, R. J. Hanna, Nevadan, Eurana, Standard Service, Pres. Wilson, Keystoner, Pennsylvanian, Lehee, Burgland, Robin Adair, Anderson, Alden Anderson, Mayfair Katherine, Enid Fiske, Kentuckian, Fenland, Ivonoma, H. W. Baxter.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
San Pedro, Calif.

Drydock, clean, paint, misc.: James McGee, Steptoe, Barge No. 41, mis. Culburra (also make and install new rudder), Kingsbury, El Cedro, Lobo, Astalia, J. A. Bostwick (extensive engine, boiler and misc.), Harvey Seeley, Dorothy Alexander. Dock, clean, paint: Velero II. Hull damage and misc.: Jennie R. Morse. Annual overhaul: Harvard. Engine, boiler, elec and misc.: West Promise. Engine, boiler: Montpelier. General reconditioning: Launch Sea Patrol. Boiler, anchor and voyage repairs, also install hatboats: Calawan. Damage repairs to hull: El Cerrito, Gregerson, H. M. Storey, Newsum, Acme, misc.: Vaquero, El Mheto, El Lobo, Idaho, A. C. Bedford, dredge Seattle, barge 1923, Wm. G. Warden, Empire Arrow, San Mateo, Grimountain, misc. Zoppot.

MOORE DRY DOCK COMPANY
Oakland, Calif.

Drydock, clean, paint, misc. engine, boiler, hull: W. O. Cactus, West Prospect, Los Angeles, Stanley Dollar, Sea Hawaiian, Manoa, Ah. Drydock, clean, paint, misc.: Point Lobos, Johann Poulsen, Virgil O. Rogue, Louise, Galilee. Hull: Intrepid, Nile, Carolyn Frances. Engine: President Lincoln, Mount Baker, Hoquiam, Sea, engine: Frank Leach, Blue Triangle, Wellesley, Anne Hanify (also boiler). Alterations to holds: President Lincoln. Install two new sections of crankshaft, Oneco. Drydock, misc.: rudder: West Ishp. Engine and deck: President Wilson, Santa Monica (also hull), Astral (also boiler). Engine and winch: China Arrow. Deck: Harold Dollar. Boiler and engine: South Coast. Furnish and install propeller: Crolona.

NAVY YARD
Puget Sound

Docking, misc. repairs: Pennsylvania, Cincinnati, Kennedy, Moody, Zeilin. Misc.: Nitro. Use repairs incidental to operating as district craft: Mallory, Chinook, Swallow, Iroquois, Shoshone, Instructor.

YARROWS, LTD.
Victoria, B. C.

Engine room: Ardenza. Drydock, cleaned, painted, extensive repairs: Hermon, Ingvald, Boehm Maru. Docked, cleaned, painted, misc.: Lehr Malahat, Thurpeal, Regulus. Rudder repairs: Cascade. Misc.: Princess Beatrice, Princess Mary.

PERSONAL PARAGRAPHS

VISITING the Pacific Coast, where he has a host of friends of the old days when he was chief engineer of the Bureau Veritas and serving with the American-Hawaiian Steamship Company, **John J. Jones**, representing the fuel oil engineering department of Morse Dry Dock & Repair Company, Brooklyn, New York, was recently in San Francisco for a brief stay before continuing his tour of the leading coast ports.

Mr. Jones announced the appointment of Berry E. Dunn & Company, Balfour building, San Francisco, as Pacific Coast agents for the Morse oil burner, the final arrangements for the agency being closed during this trip.

From San Francisco and Los Angeles Mr. Jones went on to the Middle Western territory for the purpose of appointing industrial representatives in El Paso, Dallas, Fort Worth, New Orleans, Little Rock, Memphis, St. Louis, Chicago, Toledo, Cleveland, Buffalo, Toronto, and Montreal.

This tour should round out the industrial representation of the Morse engineering department, which is already enjoying widespread popularity in the marine field.

Previous to his appointment with the Morse Dry Dock & Repair Company, Mr. Jones served as assistant superintendent of hull construction for the New York Shipbuilding Corportation. He was formerly representative in New York for the Merchant Shipbuilding Corporation of the Harriman interests.

CANADIAN PACIFIC

E. L. Sheehan has been appointed general agent of the passenger department of the Canadian Pacific Railway Company and Canadian Pacific Steamship Services at Seattle, succeeding **E. F. L. Sturdee**, who has been transferred to Hongkong as acting general passenger agent in the Orient. Mr. Sheehan has served the organization for eighteen years.

ALASKA'S AGENT

John W. Chapman, formerly Pacific Coast manager for the Williams Steamship Line, has been appointed San Francisco agent for the Alaska Steamship Company. This line, during the coming summer, will send two cargo vessels to San Francisco to handle dredge materials and general supplies. These ships will work on a contract entered into between the Alaska Steamship Company, the Yuba Manufacturing Company, and the Hammond Consolidated Goldfields, Inc., of San Francisco, covering the handling of freight and passenger business. Mr. Chapman announces that the company proposes to run a special excursion from Seattle on July 2 to Nome and St. Michael with return via Unalaska, Akutan, Seward, Latouche, Valdez, Columbia Glacier, Cordova, Juneau, Wrangel and Ketchikan.

METAL MIKE'S FAMILY

The tanker Charles M. Everest of the Vacuum Oil Company has been

(Section continued in Shipping Directory, page 13)

Passenger offices of Pacific Coast steamship organizations have progressed with [illegible] the new passenger quarters of the Matson Navigation Company, in the Matson building, Market and Mason streets, San Fran[illegible]. The Matson Line operates six passenger steamers, five from San Francisco and one from Seattle, to the Hawaiian Islands. The [illegible] on January 17. Marbleized rubber flooring keeps sound to a minimum, and double plate glass with [illegible] eliminated the noise from Market street traffic.

PACIFIC MARINE REVIEW'S
INTERCOASTAL-OFFSHORE-COASTWISE
DIRECTORY
LINES SERVING PACIFIC COAST PORTS

INTERCOASTAL

SAN FRANCISCO

AMERICAN-HAWAIIAN S. S. CO.
215 Market street. Phone Douglas 9560.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, San Francisco, Oakland, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vanvouver, Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Kearny 4570.
PASSENGERS AND FREIGHT.
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles, and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between San Francisco, Seattle, Vancouver, B. C., Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
201 California street. Phone Sutter 7600.
FREIGHT ONLY.
SAILINGS—North Atlantic - Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to New York, Boston and Philadelphia.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commercial S. S. Lines.)
Swayne & Hoyt, Inc., Pacific Coast agents.
430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Intercoastal.
By five steamers between New York, Philadelphia, Wilmington, Norfolk, Baltimore and Los Angeles, San Francisco, Portland and Seattle.

MUNSON-McCORMICK LINE
McCormick Steamship Co., Pacific Coast agts.
215 Market street. Phone Kearny 5100.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

NAWSCO LINE
(North Atlantic & Western Steamship Corpn.)
The Robt. Dollar Co.
311 California street. Phone Kearny 4570.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Regular service between Seattle, Tacoma, Portland, Astoria, San Francisco, Los Angeles, Philadelphia, New York, Boston and Portland, Me.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3800.
SAILINGS—Intercoastal (Passengers and Freight).
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Manzanillo, Los Angeles, San Francisco.
SAILINGS—Intercoastal (Direct Freight Service).
Every 7 days. Eastward calls: San Francisco, Los Angeles, Philadelphia, New York and Norfolk. Westward calls: New York, Baltimore, Norfolk, Los Angeles, San Francisco.

PACIFIC-CARRIBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Offices: 550 Market street. Phone Douglas 8680.
Freight and Operating Offices: Pacific Steamship Co. of California St. Phone Sutter 7800.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
W. D. Benson, Pac. Coast Mgr.,
311 California street.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Puget Sound.

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, agents.
230 California street. Phone Garfield 2846.
FREIGHT ONLY.
SAILINGS Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
A. F. Zod, Pacific Coast manager.
110 California street. Phone Douglas 1670.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 14 days between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, and New York, Philadelphia, Norfolk and Baltimore.

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Dershem, agent.
Mutual Life Building.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Every 10 days between Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, agent.
470 L. C. Smith Building. Phone Elliott 0974
FREIGHT ONLY.

fitted with a Sperry gyro-compass, a gyro-pilot or automatic steering equipment, and a Sperry helm angle indicator system. The entire Vacuum fleet is to receive the advantages of this modern navigational equipment, installations being made as the vessels reach port during the next few weeks.

GOOD FOR MONROE

George E. Monroe has joined Theodore Crane & Sons as assistant superintendent. Mr. Monroe has had a wide range of experience in the field. At one time he was with the Fulton Iron Works, San Francisco, and more recently was chief engineer for a number of ship operating firms. Prior to joining the Crane organization he served as outside supervisor and estimator at the Tebo Yacht Basin, Todd Shipyards Corporation.

CORY CHANGES

George M. Marr, for the past four years district manager at Philadelphia for Chas. Cory & Son, Inc., has been transferred to the sales department at the main offices in New York. **Robert L. Reaves**, formerly electrical engineer at Hog Island and more recently connected with the Naval Air Station at Lakehurst, has been appointed to the district managership in Philadelphia, succeeding Mr. Marr.

TODD, NEW ORLEANS

Todd Engineering, Dry Dock & Repair Company, Inc., the new plant of the Todd Shipyards Corporation, at New Orleans, was officially opened on March 15. The plant represents a further extension of the Todd organization's far-reaching service to owners and operators. The New Orleans unit is completely equipped with modern machinery of every type and is manned by a competent staff under the supervision of **M. E. Hart**, general manager. The plant is now ready to handle marine repairs quickly, efficiently, and eco-

INTERCOASTAL

SAILINGS—Intercoastal Service.
Regular sailings between Los Angeles, San Francisco, Vancouver New York, Boston, Baltimore, Philadelphia, Norfolk and Portland, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
L. C. Smith Building. Phone Elliott 1206.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland, Los Angeles, New York, Boston and Philadelphia.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commercial S. S. Lines)
Swayne & Hoyt, Inc., agents.
Central Building. Phone Elliott 6383.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 3 weeks between Seattle, Tacoma, Portland, San Francisco, Los Angeles, New York, Philadelphia, Wilmington, Baltimore and Norfolk.

MUNSON-McCORMICK LINE
Pier 6. Phone Elliott 5367.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco, Portland, Tacoma and Seattle.

NAWSCO LINE
(North Atlantic & Western Steamship Co.)
Admiral Oriental Line.
L. C. Smith Building. Phone Elliott 3744.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Regular service between Seattle, Tacoma, Portland, Astoria, San Francisco, Los Angeles, Philadelphia, New York, Boston and Portland, Me.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt.
Central Building. Phone Elliott 4263.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile, Havana, Cuba and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
Intercoastal Service, The Matson Navigation Company.
Pacific Steamship Company, agents.
L. C. Smith Building. Phone Elliott 2063.
SAILINGS—Intercoastal.
Regular service between New York, San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
Transmarine Corporation.
[illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles.

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, agents.
[illegible]
FREIGHT ONLY.
SAILINGS—Weekly [illegible]

WILLIAMS LINE
Williams Steamship Company, Inc.
Spokane Street [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal
Every 14 days between Seattle, Tacoma, San Francisco [illegible]

LOS ANGELES

AMERICAN-HAWAIIAN S. S. CO.
W. S. Melthenny, agent.
Central Building. Phone [illegible]
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.

SAILINGS—Ever[illegible]
attle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Van Nuys Building. Phone Maine 873044.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks from Vancouver, Seattle, Portland, San Francisco and Los Angeles to New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
[illegible] Mortgage Building. [illegible] South Spring Street. Phone [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Sailings between Los Angeles, San Francisco, Seattle, Vancouver, B. C., New York, Boston, Baltimore, Philadelphia, Norfolk and Portland, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Building. Phone 873344.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
200 West Eighth Street. Phone Main 808.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Los Angeles, New York, Boston and Philadelphia.
SAILINGS—Gulf Service.
Every 14 days from Portland, San Francisco and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commercial S. S. Lines)
Swayne & Hoyt, Inc., agents.
448 Ingalls Exchange Bldg. Phone 524 [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal.
by five steamers between New York, Philadelphia, Wilmington, Baltimore, Norfolk, Portland, Astoria, San Francisco, Portland and Seattle

MUNSON-McCORMICK LINE
McCormick Steamship Corp.
Lane-Morrison Bldg. Phone Main [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland, Astoria, Seattle and Tacoma

NAWSCO LINE
[illegible] Admiral Oriental Line, Western Steamship Co.
The Robert Dollar Company, agents.
[illegible] Phone 524 [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal.
Regular service between New York, San Francisco, Los Angeles, Philadelphia, New York, Portland, Maine.

PACIFIC MAIL STEAMSHIP CO.
[illegible]
SAILINGS—Intercoastal PASSENGERS AND FREIGHT).
Every 28 days from San Francisco and Los Angeles via Manzanillo, San José de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Also from New York, Baltimore, Cristobal, Balboa, Corinto, La Libertad, San José de Guatemala, Los Angeles and San Francisco.
SAILINGS—Intercoastal DIRECT FREIGHT SERVICE.
[illegible] New York, Baltimore, Norfolk, Newport News, New York, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., agents.
[illegible]
FREIGHT ONLY.
SAILINGS—Monthly from [illegible] Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile, Havana, Cuba and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA-PACIFIC LINE
Intercoastal Service, The Matson Navigation Company.
Freight Office: [illegible] Building.
322 Crocker Building. Phone [illegible]
Passenger Office: [illegible]

nomically to vessels in and near New Orleans. As in all other Todd yards, expert oil burning engineers have been attached to the New Orleans plant to assist and advise on all oil burning matters. In addition to the New Orleans yard and the plant at Mobile, the Todd Shipyards Corporation has two yards on the Gulf, two yards on the Pacific, and four yards in New York.

BRIGHT START

Richard F. Sheridan and **C. F. Tait** have organized the Crown Terminal Company with offices at 149 California street, San Francisco. The success of their initial efforts is shown in securing the clerking and handling of the Furness Line at San Francisco. Mr. Sheridan is well known in shipping circles through past connections with the Atlantic, Gulf & Pacific Steamship Company, Dodwell & Company, Ltd., and Furness-Withy & Company, Ltd. Mr. Tait is equally familiar in the marine field through his eleven years experience with Balfour, Guthrie & Company, Dodwell & Company, Ltd., and as Manila manager for Christenson, Hanify & Weatherwax. **R. A. Satterwaite** is in charge of the Crown Terminal Company's dock operations. Messrs. Tait and Sheridan will also conduct a general shipping and commission business.

A-H OFFICERS

The annual election of officers of the American-Hawaiian Steamship Company was held March 20 in San Francisco, the headquarters of the company. Officers chosen for the ensuing year are: **Cary W. Cook**, president; **Henry Dearborn** of Seattle, first vice-president; **J. D. Tomlinson**, second vice-president. The directors named were: **Cary W. Cook, W. A. Harriman, W. D. Clark, John Rosenfeld, R. D. Lapham, Henry Dearborn, L. G. Hengstler** and **J. D. Tomlinson**. All officers and directors were re-elected.

OPEN IN PORTLAND

Struthers & Barry are to establish an office in Portland, according to announcement by Harry Struthers. The move is actuated by expansion of the company's business. The Portland office will be handled by **F. J. Hayward**, a well-known Pacific Coast marine executive.

WILLIAMS LINE

A. F. Zipf, recently appointed Pacific Coast manager for the Williams Steamship Line, announces that a consignment of naval guns valued at $1,000,000 will be handled on the

UNITED AMERICAN LINES, INC.

PACIFIC COAST HEADQUARTERS, 230 CALIFORNIA STREET, SAN FRANCISCO

S. S. Mount Clinton—One of the Express Intercoastal Freighters

INTERCOASTAL WEEKLY SERVICE VIA PANAMA CANAL

Baltimore-New York-Boston
Philadelphia and Los Angeles
San Francisco-Seattle-Portland

NORTH PACIFIC-EUROPEAN FORTNIGHTLY SERVICE

PASSENGERS and FREIGHT

Between North Pacific Ports
and
United Kingdom-Continent

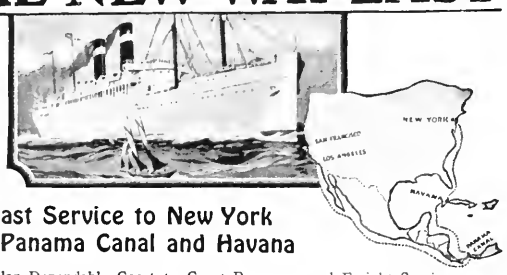
PACIFIC COAST AGENTS

LOS ANGELES S.S. COMPANY, Los Angeles — SUDDEN & CHRISTENSON, San Francisco and Puget Sound — COLUMBIA PACIFIC SHIPPING CO., Portland

ATLANTIC COAST AGENTS

UNITED AMERICAN LINES, INC.

THE NEW WAY EAST



Fast Service to New York via Panama Canal and Havana

Regular Dependable Coast to Coast Passenger and Freight Service
New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle, Tacoma

WESTBOUND	From New York, Pier 61, N. River
MANCHURIA	Apr 17
KROONLAND	May 1
FINLAND	May 15
MANCHURIA	June 5
KROONLAND	June 19
FINLAND	July 3

EASTBOUND	From San Francisco, Pier 22—Los Angeles Har.	
KROONLAND	Apr 5	Apr 7
FINLAND	Apr 19	Apr 21
MANCHURIA	May 10	May 12
KROONLAND	May 24	May 26
FINLAND	June 7	June 9
MANCHURIA	June 28	June 30

Direct connections at New York and thru Bills of lading issued via: American Line to HAMBURG, Red Star Line to ANTWERP, Atlantic Transport Line to LONDON, White Star Line to LIVERPOOL, SOUTHAMPTON and MANCHESTER

PANAMA PACIFIC LINE

INTERNATIONAL MERCANTILE MARINE COMPANY

Passenger Offices:
T. H. LARKE—Pacific Coast Manager

SEATTLE, 619 Second Ave — SAN FRANCISCO, 550 Market St. — LOS ANGELES, 510 South Spring St.

PACIFIC STEAMSHIP CO. (The Admiral Line), General Freight Agents Pacific Coast

SAN FRANCISCO, 60 California St — LOS ANGELES, 322 Citizens National Bank — SEATTLE, L. C. Smith Bldg. — PORTLAND, Admiral Line Terminal

INTERCOASTAL

SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
(Transmarine Corporation.)
G. T. Darragh, agent.
A. G. Bartlett Bldg. Phone 873-235.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles and San Francisco and Puget Sound.

UNITED AMERICAN LINES, INC.
Los Angeles Steamship Company, agents.
306 Central Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company.
Stock Exchange Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 14 days between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, and New York, Philadelphia, Norfolk and Baltimore

PORTLAND

AMERICAN-HAWAIIAN S. S. CO.
C. D. Kennedy, agent.
Railway Exchange Building.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles, Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
400 Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Portland, York, Boston, Providence, Philadelphia and Baltimore.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, Tacoma, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
Spalding Building. Phone Broadway 4378.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to New York, Boston and Philadelphia.
SAILINGS—Gulf Service.
Every 14 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commercial S S Lines)
Swayne & Hoyt, Inc., agents.
Spalding Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
By five steamers between New York, Philadelphia, Wilmington, Baltimore, Norfolk and Los Angeles, San Francisco, Portland and Seattle.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
181 Burnside street. Phone Broadway 1498.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland and Seattle.

NAWSCO LINE
(North Atlantic & Western S. S. Company.)
Admiral Oriental Line, agent.
101 Third street. Phone Broadway 5481.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Regular sailings between Portland, San Francisco, Los Angeles, Philadelphia, New York, Boston and Portland, Maine.

PACIFIC MAIL STEAMSHIP CO.
Norton, Lilly & Co., agents
Yeon Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days. Eastward calls: San Francisco, Los Angeles, Baltimore, New York and Norfolk. Westbound calls: New York, Baltimore, Norfolk, Los Angeles, San Francisco.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., agents
Spalding Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Pacific Steamship Company, freight agents.
Admiral Line Terminal.
SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
(Transmarine Corporation)
Geo. Powell, agent.
Wilcox Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Puget Sound

UNITED AMERICAN LINES, INC.
Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle

VANCOUVER

ARGONAUT STEAMSHIP LINE
B. W. Greer & Son, Ltd.
602 Hastings street, West.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Vancouver, B. C., Seattle, San Francisco, Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk and Portland, Me.

ISTHMIAN STEAMSHIP LINES
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Empire Shipping Company, Ltd.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Vancouver, Seattle Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans, and Mobile

MOORE & McCORMACK CO., INC.
Canadian American Shipping Company, Ltd.
Phone Seymour 2198.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 3 weeks from North Pacific Coast ports, San Francisco, Los Angeles, to New York, Philadelphia, Wilmington, Baltimore and Norfolk.

MUNSON-McCORMICK LINE
King-Lee Navigation Company, Ltd.
607 Pacific Building. Phone Seymour 9506.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco and North Pacific Coast ports.

NAWSCO LINE
(North Atlantic & Western Steamship Co.)
Canadian Robert Dollar Co., Ltd.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Regular sailings between North Pacific Coast ports and San Francisco, Los Angeles, Philadelphia, New York, Boston and Portland, Me.

PACIFIC-CARIBBEAN GULF LINE
Dominion Shipping Company.
618 Pacific Building. Phone Seymour 1905.
FREIGHT ONLY.

SAILINGS—Monthly from North Pacific ports, San Francisco, Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports.

steamer Willhilo from the Bremerton yard to the Norfolk Navy Yard at Portsmouth, Virginia. Mr. Zipf left San Francisco for Seattle in interest of the contract. The Williams Line was low bidder to the Navy Department solicitation and accordingly was awarded the transport order. Each of the giant guns weighs 145,000 pounds and is 55 feet long, 14 inches in diameter at the muzzle and .45 caliber. Each of the ten guns is valued at $100,000, and the Williams Line under the contract insured the shipment for $1,000,000.

U. A. L. TRAVEL

T. H. Jacobs, Pacific Coast passenger manager of the United American Lines, has completed a tour of all cities and agencies in the Pacific Northwest, returning to his San Francisco headquarters on March 15. Mr. Jacobs reports strong indications of heavy passenger traffic between Pacific Coast ports and Europe this summer.

FURNESS (PACIFIC) LTD.

Roy V. Ross is manager of the Vancouver office of Furness (Pacific) Ltd., the new $500,000 corporation recently organized by Furness-Withy & Company. The directors of Furness (Pacific) Ltd. are: **T. A. Lee, Roy V. Ross, J. J. Walsh,** and **E. C. Mayers,** Vancouver attorney. Mr. Walsh is assistant to Mr. Lee, who has been Pacific Coast manager for Furness-Withy & Company. Mr. Lee and Mr. Walsh retain their titles in connection with Furness-Withy & Company's Pacific Coast affairs. Mr. Ross has been connected with Frank Waterhouse at North Pacific ports. The Seattle office of the Furness interests will be in charge of **Harold W. Burchard. Keith Fisken** will be Portland, Oregon, manager for the Furness (Pacific) Ltd.

NEW CHIEF STEWARD

J. H. Hall, former chief steward on the the steamer City of Los Angeles, has been appointed port steward for the Los Angeles Steamship Company, succeeding **Harvey Rothschild,** who resigned to enter private business, according to announcement by **R. J. Chandler,** general manager of the line.

LAWRENCE WAREHOUSE

Ralph E. Devinney, well-known shipping and transportation official, has been appointed Oakland manager for the Lawrence Warehouse

ORIENTAL

SAN FRANCISCO

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
Dodwell & Company.
2 Fine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.
SAILINGS—India Service.
Once every 4 or 5 months from Vancouver to usual ports, Bombay and Calcutta.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Kearny 4370.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings between San Francisco, Seattle, Vancouver, Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles.

GARLAND STEAMSHIP CORP.
FREIGHT ONLY.
244 California street. Garfield 4700.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from San Francisco and Portland direct to Shanghai and Manila.

MITSUI & COMPANY, LTD.
Mitsui Bussan Kaisha
Merchants Exchange Bldg. Phone Sutter 3414.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NIPPON YUSEN KAISHA
Dodwell & Company, Ltd.
2 Fine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Regular service between China, Japan ports and United States Atlantic ports via Panama Canal, vessels calling at San Francisco on both outward and homeward voyages. One arrival monthly from Japan, discharging cargo at San Francisco. One to two sailings monthly homeward, occasionally loading cargo for Yokohama, Kobe and Shanghai.

OSAKA SHOSEN KAISHA
McCormick, Melpherson & Lanham.
303 Market street. Phone Kearny 3632.
SAILINGS—San Francisco Service (FREIGHT ONLY).
Monthly service to and from Yokohama, Kobe, Moji, Shanghai, Hongkong and Singapore.
SAILINGS—Los Angeles Service (PASSENGERS AND FREIGHT).
A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, the Panama Canal and Los Angeles.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3500.
(Operating U. S. S. B. vessels.)
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific Service.
Every 14 days from San Francisco to Honolulu, Yokohama, Kobe, Shanghai, Manila and Hongkong.
SAILINGS—Hongkong-India (Freight Only.)
Connection at Hongkong every 2 weeks for India ports.

STRUTHERS & BARRY
(Operating U. S. S. B. vessels.)
112 Market street. Phone Sutter 7640.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular intervals from San Francisco and Los Angeles, thence to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Dairen, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA
(Oriental Steamship Company, Ltd.)
549-51 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific.
Twice a month, every second Thursday, between San Francisco and Honolulu, China, Japan and Manila.
SAILINGS—Monthly to China and Japan ports from the West Coast of Mexico with temporary call at Los Angeles.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

YAMASHITA KISEN KOGYO KAISHA
Yama-hita Company, Inc., agents.
222 Robert Dollar Bldg. Phone Garfield 3899.
PASSENGERS AND FREIGHT.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

SEATTLE

ADMIRAL ORIENTAL LINE
L. C. Smith Building. Phone Elliott 2098.
SAILINGS—PASSENGERS AND FREIGHT.
Every 12 days between Seattle, Victoria, B. C., Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—FREIGHT ONLY.
Regular service to Vladivostok, Dairen, Tientsin, Tabu Bar, Tsingtao, Shanghai and Japan ports on either outward or homeward voyages, as freight offers justify direct call.
SAILINGS—Monthly service to Yokohama, Kobe, Shanghai, Foochow, Amoy, Swatow, Manila, Cebu and Iloilo.

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., agents.
Smith Building. Phone Elliott 2165.
PASSENGERS AND FREIGHT.
SAILINGS Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong and Manila.

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, agents.
L. C. Smith Building. Phone Elliott 0794.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular sailings North Pacific Coast ports to Shanghai, Kobe, Hongkong and Manila, returning via Los Angeles and San Francisco.

R. T. JOHNS & COMPANY
R. T. Johns & Company, agents.
Central Building. Phone Elliott 3[illegible].
FREIGHT ONLY.
SAILINGS—Irregular service between Seattle and Oriental ports of Yokohama, Kobe, Nagoya, Shimidzu and Moji.

MITSUI & COMPANY, LTD.
Mitsui Bussan Kaisha
American Bank Building. Phone Elliott 1450.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco, Portland, Seattle and Puget Sound ports, thence to China and Japan.

NIPPON YUSEN KAISHA
Colman Building. Phone Elliott 3514.
PASSENGERS AND FREIGHT.
SAILINGS—Frequent intervals, calling at Victoria or Vancouver, B. C., Yokomama, Moji, Nagasaki, Shanghai, Hongkong or other Oriental ports as inducements offer.

OSAKA SHOSEN KAISHA
W. C. Dawson & Company, agents.
Mutual Life Building. Phone Elliott 6642.
PASSENGER AND FREIGHT.
SAILINGS Regular fortnightly service to Yokohama, Kobe, Moji, Dairen, Shanghai, Hongkong and Singapore.

SUZUKI & COMPANY
Colman Building. Phone Elliott 2535.
FREIGHT ONLY.
SAILINGS—Irregular service between Seattle and Japanese ports.

THORNDYKE, TRENHOLME CO.
L. C. Smith Building. Phone Main 3188.
FREIGHT ONLY.
SAILINGS Regular service between Puget Sound, Grays Harbor, Vancouver and Victoria, Kobe, Osaka and Nagoya.

WALKER-ROSS, INC
L. C. Smith Building. Phone Elliott [illegible]
FREIGHT ONLY.
SAILINGS—Regular service between Seattle and Yokohama, Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO
Yamashita Company, Inc., agents.
Colman Building.
FREIGHT ONLY.
SAILINGS Every 2 weeks from Seattle to Yokohama, Kobe, Osaka, Nagoya.

LOS ANGELES

CANADIAN GOVERNMENT MERCHANT MARINE
Dodwell & Company.
412 Title Ins. Bldg. Phone [illegible]
and 634944
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.
SAILINGS—India Service.
Once every 4 or 5 months from Vancouver to usual ports, Bombay and Calcutta.

Company, according to announcement by Al. T. Gibson, president of the firm. Mr. Devinney has served the Lawrence organization for two years. He was formerly connected with the Atlantic, Gulf & Pacific Steamship Company and the Luckenbach Lines. Familiarity with industrial development and the establishment of Pacific Coast branches of eastern concerns brought Mr. Devinney into the warehouse and distribution business where he has a host of friends.

DEATHS

Frank A. Fish, retired assistant superintendent of river steamers for the Southern Pacific Company, passed away March 19 at his home in Benicia, California. Mr. Fish began service with the Southern Pacific Line in 1876. It is estimated that he covered 936,000 miles on the river steamers. He etired from active duty in 1921. He is survived by a widow and one son.

TRADE NOTES

The Hudson Bay Company, Vancouver, B. C., may build two new vessels for use in the Arctic, one to be of steel construction.

The General Contracting Corporation, Pittsbugh, Pennsylvania, is preparing plans for the construction of one steel towboat, one steel hull dredge boat, one steel hull derrick boat, and two steel hull dump scows for use on the Ohio River.

New York City Department of Docks has appealed to the Board of Commissioners for authorization to build a fleet of modern dredges, the dredges to be used principally in Jamaica Bay.

Plans for construction of a steel towboat are now being prepared by the Carnegie Steel Company of Pittsburgh.

The Pittsburgh Plate Glass Company, Pittsburgh, Pa., will, on completion of its new plant at Creighton, Pennsylvania, need a river fleet. This will include steamboat, barges, and sand and gravel barges, the whole to cost approximately $750,000.

The McClain Sand Company, Point Marion, Pennsylvania, may build an oil-burning towboat.

The Interstate Public Service Company, Indianapolis, Indiana, may build a river fleet of coal barges to be operated in conjunction with its

ORIENTAL

DOLLAR STEAMSHIP LINE
212 Mortgage Guarantee Bldg. Phone 874-891.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings between Los Angeles, San Francisco, Seattle, Vancouver, Yokohama, Kobe, Shanghai, Hongkong, and Manila.

OSAKA SHOSEN KAISHA
McCormick, McPherson & Lapham.
Central Building.
PASSENGERS AND FREIGHT.
SAILINGS—A steamer a month to Yobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, Panama Canal and Los Angeles.

STRUTHERS & BARRY
(Operating U. S. S. B. vessels.)
710 Pacific Electric Bldg. Phone L. A. 822789.
FREIGHT ONLY.
SAILINGS—Regular intervals from San Francisco and Los Angeles, thence to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Dairen, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA
(Oriental Steamship Company.)
S. L. Kreider, agent.
375 Pacific Electric Bldg. Phone 876-556.
PASSENGERS AND FREIGHT.
SAILINGS—Every second Thursday to China and Japan via San Francisco on steamers of Japan, Hongkong, San Francisco line.
SAILINGS—Monthly to Oriental ports via San Francisco and Los Angeles on steamers from West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental New York via Panama Canal.

PORTLAND

GARLAND STEAMSHIP CORP.
General Steamship Corp., agents.
212 Porter Bldg. Phone Broadway 6714
FREIGHT ONLY.
SAILINGS—Every 2 weeks from San Francisco and Portland direct to Shanghai and Manila

MITSUI & COMPANY, LTD.
Mitsui Bussan Kaisha.
702 Wilcox Building. Phone Main 4113.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan

NORTH CHINA LINE
(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Taku Bar and Dairen.

TOYO KISEN KAISHA
(Oriental Steamship Company.)
Oregon Pacific Company, agents.
204 Wilcox Building. Phone Bdwy. 4829.
FREIGHT ONLY.
SAILINGS—Monthly from Portland to Orient to
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental New York via Panama Canal.

SOUTH CHINA LINE
(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Broadway 5360
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Portland to Yokohama, Kobe, Hongkong and Manila

YAMASHITA KISEN KOGYO
Yamashita Company.
1109 Porter Building.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., agents.
Yorkshire Building. Phone Seymour 957
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.
SAILINGS—India Service.
Once every 4 or 5 months from Vancouver to usual ports, Bombay and Calcutta.

CANADIAN PACIFIC STEAMSHIPS, LTD.
Canadian Pacific Railway Station. Phone Seymour 2630.
PASSENGERS AND FREIGHT.
SAILINGS—Every 14 days from Vancouver to Japanese ports, Shanghai and Hongkong.

DOLLAR STEAMSHIP LINE
Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings from North Pacific ports to Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles and San Francisco

NIPPON YUSEN KAISHA
R. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Vancouver and ports in Japan, China and Philippines.

OSAKA SHOSEN KAISHA
Empire Shipping Company, Ltd.
815 Hastings St., W. Phone Seymour 8614 8014
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks to all ports in Japan and China, also Vladivostek, Singapore, Bombay, etc.

SUZUKI & COMPANY
B. L. Johnson Walton & Company.
850 Hastings street, West. Phone Seymour 7167
FREIGHT ONLY.
SAILINGS—Irregular service between Pacific Coast ports and Japan ports.

WALKER-ROSS, INC.
Canada-American Shipping Company, Ltd.
Phone Seymour 2198.
FREIGHT ONLY.
SAILINGS—Regular service to Yokohama, Kobe, Osaka and Nagova.

YAMASHITA KISEN KOGYO KAISHA
Sandvaard & Co., Ltd.
FREIGHT ONLY.
SAILINGS—Every 2 weeks to Yokohama, Kobe, Osaka and Nagova

UNITED KINGDOM---CONTINENTAL EUROPE

SAN FRANCISCO

BLUE FUNNEL LINE
Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.
2 Pine street. Phone Sutter 4201.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.
The East Asiatic Company, Inc., agents.
433 California street. Phone Sutter 6717.
PASSENGERS AND FREIGHT.

SAILINGS. Regular [illegible] Coast ports to London, Liverpool, Glasgow, Gothenburg and Copenhagen with transshipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE, LTD.
Norton, Lilly & Company, general agents.
485 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports, via Hull.

proposed $10,000,000 power station on the Ohio River new Louisville.

* * *

With the coming of spring and the opening of active navigation on the Great Lakes, a great many shipbuilding projects are being given consideration. Among the firms who will be likely to engage in such activity are The Ford Motor Company of Detroit, The Mitchell Steamship Company of Cleveland, and The Detroit & Windsor Ferry Company of Detroit.

* * *

According to reports received from the East, the Canal and River Transportation Company of Buffalo, New York, is planning a packet line of twelve diesel vessels to be operated on the New York state barge canal.

* * *

The following bids were submitted March 3 for work of general repairs and improvements to the Army transport Grant: Bethlehem. $24,432; General Engineering, $24,691; Moore Drydock Co., $26,251; Hanlon Drydock Co., $26,251; Crowley Shipyards, $29,753; and Neptune Machine Works, $38,810.

* * *

Bethlehem Shipbuilding Corp., San Francisco, sent men to Honolulu to repair the Dollar Line round-the-world feighter Virginia Dollar, which was badly damaged in a storm and turned back to Honolulu.

Other repairs performed recently at San Francisco Bay shipyards included:

Repairs and renewals to steamer West Elcajon by the Bethlehem Shipbuilding Corp., San Francisco, $30,960.

Conditioning for active service, laid-up Shipping Board steamer West Harts by General Engineering & Drydock Co., Oakland, $16,809.

Bids submitted for repairing and reconditioning the Mary E. Moore were as follows: Hanlon Drydock Co., $39,000, 39 days; Moore Dry Dock Co., $30,920, 60 days; Bethlehem, $31,000, 28 days; General Engineering & Drydock Co., $41,500, 40 days; Main Iron Works, $29,296, 36 days.

Navy Yard at Mare Island has been authorized by the Navy Department to convert the Canopus into a mother ship for divers. It is estimated that the job will amount to $200,000. The Navy yard also submitted the lowest bid of $8335 for rebuilding the revenue cutter Bear.

UNITED KINGDOM---CONTINENTAL EUROPE

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation, sub-agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Twice a month between Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
710 Balfour Building. Phone Sutter 6478-6479.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports when inducements offer.

GENERAL STEAMSHIP CORP.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
351 California street. Phone Sutter 6437.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
F. C. Evans & Sons, agents.
260 California street. Phone Douglas 8040-1-2.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
W. R. Grace & Co., general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Havre, Bergen, Christiania, Gothberg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Royal Mail Steam Packet Company and Holland America Line.)
401 Market street. Phone Douglas 7510.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

NORWAY PACIFIC LINE
485 California street. Phone Sutter 5099.
FREIGHT ONLY.
SAILINGS—From San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavian sailings every 30 days.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
485 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS Service from Seattle, Portland, San Francisco, Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES
Sudden & Christenson, agents.
230 California street. Phone Garfield 2846.
For passenger rates see page 46.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SEATTLE

BLUE FUNNEL LINE
Dodwell & Company, Ltd., agents.
Stuart Building. Phone Elliott 2068.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.
The East Asiatic Company, Inc., agents.
823 Alaska Building. Phone Elliott 2545.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Pacific Coast ports and London, Hull, Copenhagen, Gothenburg, Christiania, with trans shipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.

SAILINGS—Monthly between Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation, agents.
Colman Building. Phone Elliott 5706.
FREIGHT ONLY.
SAILINGS—Twice a month between Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness, Withy & Company, Ltd.)
Frank Waterhouse, Incorporated, agents.
Central Building. Phone Elliott 0071.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
Colman Building. Phone Elliott 5706.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company, agents.
Alaska Building. Phone Elliott 1464.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings every 2 weeks.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
W. R. Grace & Company.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Havre, Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint Service of the Royal Mail Steam Packet Company and Holland America Line.)
204-206 Colman Building. Phone Elliott 4944.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
FREIGHT ONLY.
SAILINGS—From Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES
Sudden & Christenson, agents.
Arctic Club Building. Phone Elliott 1444.
PASSENGERS AND FREIGHT.
SAILINGS—North-Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

LOS ANGELES

BLUE FUNNEL LINE
(Ocean Steamship Company, agents for Alaska Mutual Steam Navigation Company.)
Dodwell & Company, Ltd. Building. Phone Main 7906 and 824944.
FREIGHT ONLY.
SAILINGS—Every 6 weeks from North Pacific Coast ports, including San Francisco and Los Angeles to London, Liverpool and Glasgow via Panama Canal.

EAST ASIATIC COMPANY, LTD.
Balfour, Guthrie & Company, agents.
325 Pacific Electric Building. Phone 62571.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Pacific Coast ports and London, Hull, Copenhagen, Gothenburg and Christiania, with transshipment to all Scandinavian and Baltic ports.

SHIPYARD NOTES

The Pacific Coast's crack liner, the H. F. Alexander, is now back on the coastwise run after complete overhaul of hull and machinery at Todd Dry Docks, Inc., Seattle. New boiler tubes, new propellers and a tuning of the turbines have increased her speed. The vessel will now maintain a schedule of 38 hours between Seattle and San Francisco and 16 hours between San Francisco and Los Angeles. The vessel on her first trip south from Seattle averaged a speed of over 21 knots. Her usual running sea speed will be 21 knots.

The steamer Kinau of the Inter-Island Steam Navigation Co., Honolulu, was recently converted to an oil burner. The vessel, of 975 gross tons, is an iron hull and was built and engined in 1883 by Wm. Cramp & Sons. While on drydock the Kinau was put in first-class condition in all her departments.

A tug, the Carl F. Lehners, equipped to repair ships and loaded tankers while at anchor, was launched at Los Angeles Harbor March 8. She is owned by Andrew Lucas of the Southwest Welding & Machine Company.

Fuel Oil in Industry, by Stephen O. Andros. 200 pages with numerous tables and illustrations; bound in real buckram with black stampings; published by the Petroleum Extension University, Fort Wayne, Indiana.

This is the second edition of the author's standard work on this subject. It covers in a general way the principles of fuel oil combustion, the physical and mechanical properties of fuel oil, and a comparison between coal and oil as fuels. There is a complete treatment also of the subject of colloidal fuel and an interesting chapter is devoted to the distribution and storage of fuel oil. The theory and practice of the handling of oil as a fuel, of the arrangement of boiler furnaces and of the design of fuel oil burners are covered very thoroughly. These general considerations occupy about half of the text, the remainder consisting of nine chapters, each of which is devoted to the use of fuel oil in specific industries or classes of use, including steam navigation, railway locomotives, manufacture of iron and steel, heat treating furnaces, production of electricity, sugar industry, glass industry, ceramic industries, domestic heating, and gas making.

UNITED KINGDOM---CONTINENTAL EUROPE

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Van Nuys Building. Phone Main 8734.
FREIGHT ONLY.
SAILINGS—Monthly from Puget Sound, Portland, San Francisco, Los Angeles, San Diego, to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transhipment at Hull.

FRENCH LINE
S. L. Kreider, agent.
Pacific Electric Bldg. Phone Pr[illegible] Bdwy 23.
FREIGHT ONLY.
SAILINGS—Twice a month between Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness Withy & Company, Ltd.)
Swayne & Hoyt, inc., agents.
488 Pacific Electric Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco, Los Angeles to Montreal, Quebec, Liverpool, Manchester, Hull, Leith and other ports in United Kingdom.

GENERAL STEAMSHIP CORP.
S. L. Kreider, agent.
Pacific Electric Bldg. Phone Main 8[illegible]
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
315 Oregon Building. Phone Main 7[illegible]
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to London, Hull, Leith. From August to December inclusive, fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Building. Phone Main 8734.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
H. R. & M. F. McLaurin, Inc.
406 Smith Tower. Phone Main 4400.
PASSENGERS AND FREIGHT
SAILINGS—Monthly from Pacific Coast ports to Sweden, Norway, Finland, also Helsingfors, Libau, Odessa and Hamburg.

NORTH PACIFIC COAST LINE
(Joint service of U. S. Hydrographic Office and Royal Mail Steam Packet Co.)
C. J. Lehman, agent.
121 E. Sixth Street. Phone Pr. 871.
PASSENGERS AND FREIGHT
SAILINGS—Every 3 weeks from Vancouver, Seattle, Portland, Astoria, Tacoma, Eureka and Los Angeles to London, Rotterdam, Antwerp, Hamburg.

NORWAY PACIFIC LINE
203 Pythian Castle, 558 Pine.
FREIGHT ONLY.
SAILINGS—Four motorships operating from San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavian ports as inducements offer.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
Van Nuys Building. Phone Main 8734.
FREIGHT ONLY.
SAILINGS—Service from Vancouver, Seattle, Portland, San Francisco and Los Angeles to Mediterranean ports via Panama Canal.

UNITED AMERICAN LINES
Los Angeles S. S. Company, agents.
[illegible] Pine St.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Freight originating North Pacific ports accepted for United Kingdom and Continental Europe.

PORTLAND

BLUE FUNNEL LINE
(Ocean Steamship Co., Ltd. and China Mutual Steam Navigation Company, Ltd.)
PASSENGERS AND FREIGHT.

SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles [illegible]

EAST ASIATIC COMPANY, LTD.
Chalmers & Cartwright, Inc., agents.
Porter Building. Phone Broadway 415.
PASSENGERS AND FREIGHT.
SAILINGS—Regular sailings from Pacific Coast ports and Lower [illegible] Gothenburg, Copenhagen and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2[illegible]
FREIGHT ONLY.
SAILINGS—Monthly from Puget Sound, Portland, San Francisco, Los Angeles and San Diego, to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transhipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique)
General Steamship Corporation.
Porter Building. Phone 6[illegible]
FREIGHT ONLY.
SAILINGS—Twice a month between Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Statler & Towne.
611 Lewis Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco, Los Angeles to Montreal, Quebec, Liverpool, Manchester, Hull, Leith and other ports in United Kingdom.

GENERAL STEAMSHIP CORP.
Porter Brothers Co.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
358 Oak street. Phone Main [illegible]
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to London, Hull, Leith. From August to December inclusive, fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2[illegible]
FREIGHT ONLY
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles, San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
[illegible]
PASSENGERS AND FREIGHT
SAILINGS [illegible]

NORTH PACIFIC COAST LINE
[illegible]
C. J. Lehman, agent.
[illegible] Sixth Street. Phone Pr. 871.
PASSENGERS AND FREIGHT
SAILINGS [illegible] Seattle, Portland, Astoria, Tacoma, Eureka and Los Angeles to London, Rotterdam, Antwerp, Hamburg.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2[illegible]
FREIGHT ONLY.
SAILINGS [illegible]

UNITED AMERICAN LINES
[illegible]
PASSENGERS AND FREIGHT
SAILINGS—North Pacific-European Service. Freight originating North Pacific ports accepted for United Kingdom and Continental Europe.

VANCOUVER

BLUE FUNNEL LINE, LTD.
[illegible]
Yokohama Building. Seymour 0576.
PASSENGERS AND FREIGHT.

The Radio Corporation of America has been awarded contract for radio service on the fleet of seventeen ships owned and operated by the Merchant & Miners Transportation Co. of Baltimore, Md. The service will include maintenance, operation and repair of the standard marine radio equipment installed on board these vessels, and the handling of traffic.

* * *

The Great Lakes Engineering Works, River Rouge, Mich., has a contract for lengthening and otherwise reconstructing two passenger and automobile ferries for the State of Michigan, the Colonel Card and Colonel Pond.

* * *

The Taikoo Dockyard, Hongkong, reports the following output for 1923:

Steel twin-screw steamer Wenchow, with triple-expansion engines, 3113 gross tons;

Twin-screw steamer Hang Cheong, 750 horsepower;

Twin-screw tug Yungling, 81 tons gross, 250 I. H. P. engines;

Single-screw tug, 120 I. H. P., 60 gross tons;

Steel pontoon of 4489 gross tons.

Work on hand January 1, 1924, comprised:

Two steel twin-screw steamers, to be fitted with triple-expansion engines of 1400 I. H. P., 6200 gross tons each;

Self-propelled barge of 200 I. H. P., 250 gross tons;

Single-screw tug of 300 I. H. P., 90 gross tons.

* * *

The Pacific Salvage Co., Vancouver, is about to order from a British firm a new salvage vessel to replace the Algerine; the vessel is to be especially designed for salvage work and will cost in the neighborhood of $150,000.

* * *

The first vessel of the new building program of the Nippon Yusen Kaisha, a 20,000-ton passenger and freight steamer, was recently started in Glasgow.

* * *

Merritt, Chapman & Scott Corporation has purchased a site at Long Beach, Calif., for the establishment of a terminal for the wrecking steamer Peacock, and for the construction of a plant to carry the wrecking equipment of the company.

UNITED KINGDOM---CONTINENTAL EUROPE

SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast agent.
Phone Sutter 242.
FREIGHT ONLY.
SAILINGS—Monthly to Antwerp, Rotterdam, Patterdam and Hamburg.

EAST ASIATIC COMPANY, LTD.

B. L. Johnson, Walton & Company, agents.
837 Hastings, E. W. Phone Seymour 7147.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Pacific Coast ports and London, Hull, Copenhagen, Gothenburg, Christiania, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377
FREIGHT ONLY.
SAILINGS—Monthly from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment to Hull.

FRENCH LINE

Compagnie Generale Transatlantique.
Emmy Shintaro, Ltd. Phone Seymour 8014
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver to Bordeaux, Havre, Antwerp and Hamburg.

FURNESS LINE

(Furness Withy & Company, Ltd.)
Frank Waterhouse & Company, of Canada, Ltd.
927 Rogers Building. Phone Seymour 5944
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Vancouver and other Pacific Coast ports to United Kingdom.

SAILINGS—Monthly from Vancouver to Yokohama, Kobe, Shanghai and Hongkong.

GENERAL STEAMSHIP CORP.

Emmy Shintaro Co., Ltd. Phone Seymour 8014
FREIGHT ONLY.
SAILINGS—From Pacific Coast ports to United Kingdom and Scandinavia, as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company, Ltd.
Phone Seymour 6680
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom and Continent. From August to December, fortnightly.

ISTHMIAN STEAMSHIP LINES

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
SAILINGS—Intercoastal Service.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

C. Gardner Johnson & Company, Ltd.
Metropolitan Building. Phone Seymour 357.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Scandinavia.

NORTH PACIFIC COAST LINE

(Joint service of The Royal Mail Steam Packet Co. and Holland America Line.)
Royal Mail Steam Packet Company, agents.
Pacific Building. Phone Seymour 7108.
PASSENGERS AND FREIGHT.
SAILINGS—Regular services between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

Mexico---Central America--Canal Zone---South America

SAN FRANCISCO

GRACE LINE

W. R. Grace & Company, general agents.
332 Pine street. Phone Sutter 4210.
PASSSENGERS AND FREIGHT.
SAILINGS—Approximate monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports to Peru and Chile as inducements offer.

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

LATIN-AMERICA LINE

R. S. Silva & Company, general agents.
149 California street. Phone Sutter 721.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Portland, Seattle and San Francisco to all ports on West Coast of Mexico, and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Portland, Seattle and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

McCORMICK STEAMSHIP CO.

215 Market street.
PASSAGERS AND FREIGHT.
SAILINGS—Every three weeks from San Francisco to San Jose del Cabo, La Paz, Guaymas, Topolobampo, Mazatlan, San Blas and Manzanillo.

MEXICAN NAVIGATION COMPANY

Francisco [illegible]
555 Monadnock Block. Phone Douglas 8653
PASSENGERS AND FREIGHT.
SAILINGS—Every 8 days from San Francisco and Los Angeles to the West Coast of Mexico.

MEXICAN STATES LINE

Williams, Dimond & Co.
310 Sansome street. Phone Sutter 7400.
PASSENGERS AND FREIGHT.
SAILINGS—Every 8 days from San Francisco and Los Angeles to the West Coast of Mexico and Central America.

PACIFIC LINE

The Pacific Steam Navigation Company
526 Market street. Phone Sutter 4032.
PASSENGERS AND FREIGHT.
SAILINGS—Regular sailings to Peru and Chile via Panama and Havana.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
430 Sansome street. Phone Kearny 2080.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PACIFIC MAIL STEAMSHIP CO.

508 Clinton street. Phone Sutter 3600
SAILINGS—West Coast Mexico-Panama (Passengers and Freight).
Twice a month between San Francisco, Los Angeles, calling at ports in Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
330 Clay street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Callao, Mollendo, Arica, Iquique, Antofagasta and Valparaiso. (Other ports as inducements offer.)

TOYO KISEN KAISHA

(Oriental Steamship Company.)
420-21 Market street. Phone Sutter 3600
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via San Francisco.

SEATTLE

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 5706.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

W. R. Grace & Company, agents.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Approximate monthly service to Talara, Paita, Eten, Tacasmayo, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Valparaiso.

LATIN AMERICA LINE

Lea Mathews Shipping Corporation.
Alaska Building. Phone Elliott 4567.
FREIGHT ONLY.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Seattle, Portland and San Francisco to all ports on West Coast of Mexico, and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Seattle, Portland and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
Lobby No. 4, Central Bldg. Phone Elliott 6383.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
Alaska Building.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Callao, Mollendo, Arica, Iquique, Antofagasta and Valparaiso. (Other ports as inducements offer.)

LOS ANGELES

GENERAL STEAMSHIP CORP.

S. L. Kreider.
Pacific Electric Bldg. Phone Pico 6680; Bdy. 23.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

H. R. & M. F. McLaurin, Inc.
406 South Main street. Phone Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Approximate monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports in Peru and Chile as inducements offer.

MEXICAN NAVIGATION COMPANY

Los Angeles Freight Forwarding Company.
333 New High Street. Phone Pico 2800.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to West Coast of Mexico.

MEXICAN STATES LINE

Wheaton & Kroeger.
621 Chapman Building.
PASSENGERS AND FREIGHT.
SAILINGS—Every 8 days from San Francisco and Los Angeles to West Coast of Mexico and Central America.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
488 Pacific Electric Building.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PACIFIC MAIL STEAMSHIP CO.

Passenger offices, 503 South Spring street.
Freight offices—605 Central Building, 108 West Sixth street.
SAILINGS—West Coast Mexico-Panama (Passengers & Freight).
Twice a month between San Francisco, Los Angeles, calling at ports in Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
638 Van Nuys Building.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Callao, Mollendo, Arica, Iquique, Antofagasta and Valparaiso. (Other ports as inducements offer.)

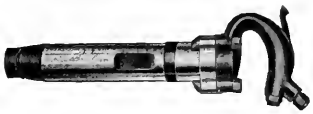
TOYO KISEN KAISHA

(Oriental Steamship Company.)
S. L. Kreider, agent.
375 Pacific Electric Bldg. Phone 876-556.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via San Francisco.

NEW TYPE RIVETING HAMMER

THE Ingersoll-Rand Company, 11 Broadway, New York City, has developed and is now offering a new type of pneumatic riveting hammer with many improved and economical features. This hammer has been thoroughly tested on all classes of work. It is now being sold only after having proved entirely satisfactory under all conditions.

The outstanding features of this new riveter include bolted construction for holding the handle to the barrel, heavy section valve with liberal bearing surfaces; combination poppet and piston type throttle valve;



power in excess of all ordinary requirements; low air consumption; and exceptionally easy operation. These hammers are manufactured in three styles, A, B and C, and are available in a complete range of sizes from a 5 to a 9 inch stroke. Each size of this riveter can be purchased with any one of three types of barrels and with either outside or inside trigger handles.

The standard A type has a barrel machined to accommodate a rivet set clip only and is furnished on all orders which do not specify either a bridge type or retainer type barrel. Three alloy steel bolts of substantial size, fitted with lock washers, hold the handle to the barrel. This is an exclusive feature of Ingersoll-Rand hammers, and enables them to be taken apart anywhere for inspection or cleaning with the aid of only a wrench; no vise, crowbar or other tools are necessary.

The throttle valve (except on inside trigger handles) is a combination of the piston and poppet types, having the nicety of control of the piston valve and the freedom from leakage of the poppet type. The beveled seat will remain tight throughout the life of the tool, preventing leakage. The throttle lever or trigger is made in one piece from special heat-treated spring steel and has a long bearing in the handle, making it capable of withstanding lots of abuse.

The control is sensitive, ranging from a light tap to a heavy blow, entirely at the will of the operator.

The valve is a sturdy sleeve made from special alloy steel. It has liberal bearing surfaces and its walls are free from holes or ports which so often are the starting points for checks or cracks. It operates in a valve box of strong construction, located in the head of the barrel. The valve box is constructed with a solid end which enables it to be easily taken apart by the use use of a piston for the removal of the valve, without recourse to the use of a screwdrive or similar instrument with subsequent danger of injury. This construction also insures a compression chamber in the valve box which cushions the piston on the return stroke and prevents the piston from striking the handle. The handles are of high quality steel, drop forged to a shape that fits the hand and are sand blast finished to give an excellent grip. Either outside or inside trigger handles can be furnished, although the outside type is standard. The exhaust is through the side of the barrel near the handle and can be deflected in any direction desired by the operator, by merely turning the deflector.

Cutting Torch Patents Sustained

OXYACETYLENE engineers, manufacturers of oxyacetylene cutting torches, and users of such equipment will be interested in the decision of Judge Learned Hand on January 8, 1924, in Davis-Bournonville Company vs. Alexander Milburn Company, which has been pending for several years in the United States District Court for the Southern District of New York. The decision sustains the contention of the Davis-Bournonville Company and its successor, Air Reduction Company, Inc., that cutting torches with tips having a plurality of heating jet passages arranged about a central cutting oxygen jet passage are infringements of U. S. Letters Patent No. 874,666 and No. 1,028,410, owned by Air Reduction Company.

These patents cover the arrangement of heating jet passages in a torch tip both with and without provision for the mixing of the heating gases within the tip. The decision is, therefore, of equal importance in its bearing on oxyacetylene cutting with the decision rendered some years ago in the suit under the Jottrand patents.

Speaking of patent No. 874,666, owned by Air Reduction Company, Judge Hand said:

"It is reasonably clear that the patentees at the time did not recognize the full value of their invention but the fact remains, whether they did or not, that they happened upon a device which became the accepted form, which has displaced all others, and which seems likely to be the final tool by which metals will be cut under this process. As such the patent is entitled to much favor from a court, especially as it appears that for nearly its whole life it has secured the substantial acquiescence of the trade. The nature of the attack upon it confirms the impression which these considerations suggest."

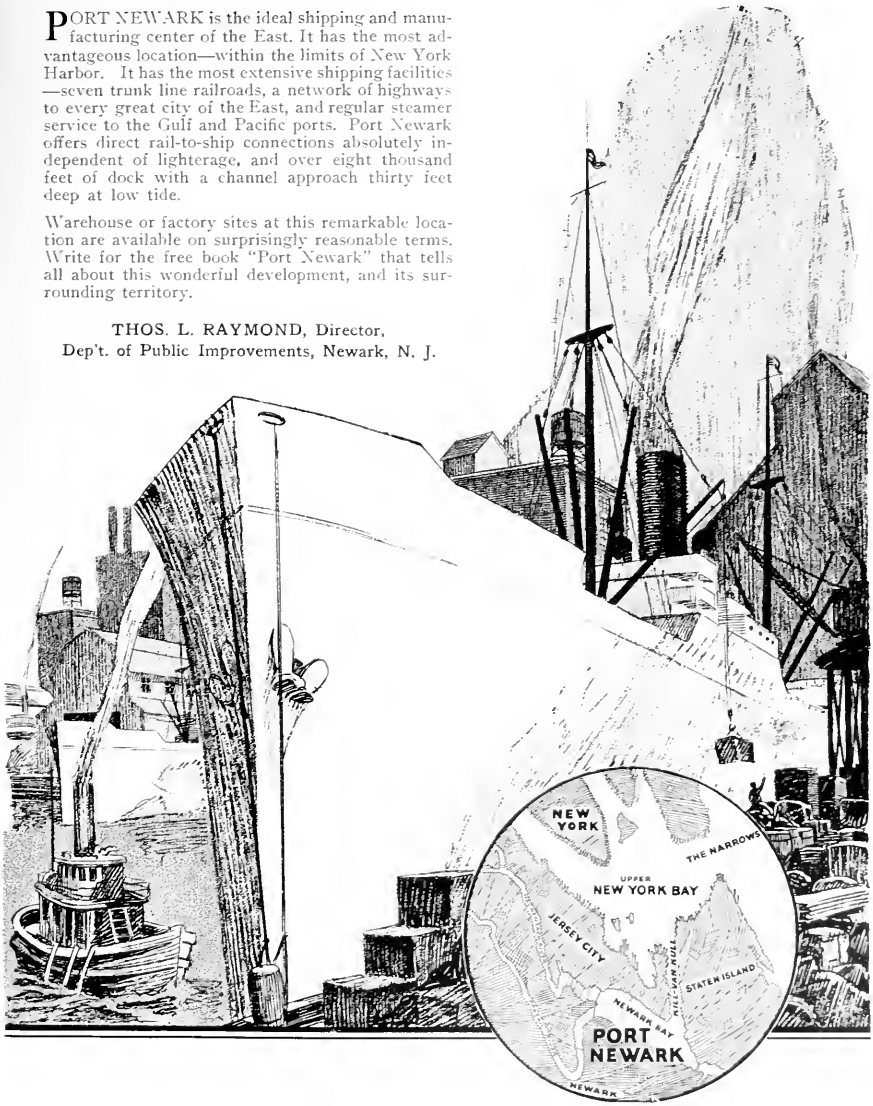
"There is no relevant prior art but Menne and Jottrand from each of which the patentees diverged. If it was an easy step from either to the patent in suit, it is curious that the art did not at once see it. The fact is that it took considerable experience and knowledge to see that in metal cutting it was necessary to 'preheat' an area considerably larger than the cut in order to get the metal to the requisite temperature for acual combustion.

PORT NEWARK

PORT NEWARK is the ideal shipping and manufacturing center of the East. It has the most advantageous location—within the limits of New York Harbor. It has the most extensive shipping facilities—seven trunk line railroads, a network of highways to every great city of the East, and regular steamer service to the Gulf and Pacific ports. Port Newark offers direct rail-to-ship connections absolutely independent of lighterage, and over eight thousand feet of dock with a channel approach thirty feet deep at low tide.

Warehouse or factory sites at this remarkable location are available on surprisingly reasonable terms. Write for the free book "Port Newark" that tells all about this wonderful development, and its surrounding territory.

THOS. L. RAYMOND, Director,
Dep't. of Public Improvements, Newark, N. J.



CONVERSION FROM STEAM TO DIESEL ENGINES

THE conversion of steamships to motorships offers a number of interesting problems. The most perplexing one perhaps is the change required in the stern of the ship in order to accommodate the larger propeller shaft required for oil engines than for steam turbines of the same power. The difference in the shaft diameters required for steam reciprocating engines and oil engines is less pronounced. As an example, the required diameters for propeller shafts for 2500 shaft horsepower engines of the various types are given:

1. Standard emergency fleet engine

$$\frac{24\frac{1}{2}'' \times 41\frac{1}{2}'' \times 72''}{48''} =$$

210 lbs. boiler pressure, 88 r.p.m.; i.h.p. 2800; s.h.p. 2500; propeller shaft 15.1".

2. 2500 s.h.p. steam turbine, 90 r.p.m., propeller shaft 14.1".

3. 2500 b.h.p. Diesel engine 110 r.p.m. fitted with a suitable flywheel, propeller shaft about 15".

The increase of almost one inch in the diameter of the Diesel engine shaft over that of the turbine shaft makes changes in the stern tube necessary.

The suggestion has been made to follow the practice of small motor craft by fitting manganese bronze propeller shafts on ocean-going ships, the diameter of the bronze shaft to be equal to the diameter of the steel shaft over the liners. The increased effective diameter thus obtained would amply provide for the greater torque of diesel engines and may avoid alterations to the stern tube. In the case of conversion from reciprocating steam to diesel engines the manganese bronze shaft will permit the installation of diesel engines of larger power.

The question then arises as to the characteristics of manganese bronze, to be equal in strength and flexibility to forged steel. Tests of manganese bronze propellers show that no difficulties are experienced in obtaining a minimum tensile strength of 65,000 pounds per square inch with a minimum elongation of 28 per cent, which is equal in all respects to the strength requirements for steel shafts. Owing to its plain form, the casting of shafts up to 20 feet in length should be an easy proposition; for shafts of greater length the casting may be drawn and a keyed flanged end provided. In order to save weight and cost the bronze may be cast around a wrought iron tube. The Rules permit a central hole in a shaft equal to one-third the diameter of the lineshaft without increasing the outside diameter. It may be advisable, however, from the standpoint of rigidity to make the shaft solid in way of the after stern bearing and the propeller.

In addition to the advantage of the permissible increased torque, the following advantages are claimed for manganese bronze shafts:

1. Elimination of the tedious work of fitting tight bronze shaft liners.

2. Elimination of galvanic action between steel shafts and bronze liners.

3. Increase in life of the shaft by eliminating galvanic action and shaft corrosion.

4. Elimination of stuffing box at forward end of propeller.

5. No tallow packing required in propeller cap and in core of hub.

6. More readily obtainable.

7. Possible lower cost. (Bulletin—American Bureau of Shipping.)

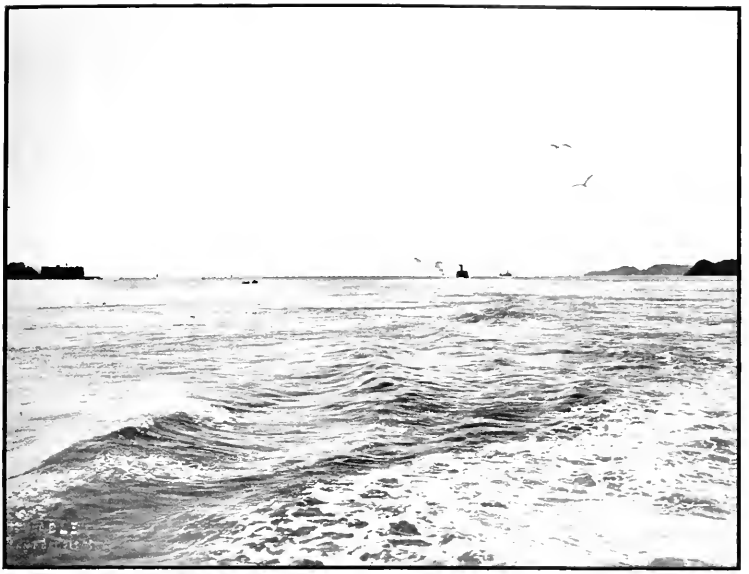
Pacific Marine Review

The National Magazine of Shipping

MAY, 1924

Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION
OF THE PACIFIC COAST



THE GOLDEN GATE

Looking out to Sea from San Francisco Bay — From left to right: Fort Point, Mile Rock, Admiral liner Emma Alexander, Fishing Launch, Union liner Tahiti, a Standard Oil Tanker, a Lumber Schooner, Matson liner Manoa, the ubiquitous Seagulls, Point Bonita and Lime Point.

Vol. XXI MAY, 1924 No. 5

Pacific Marine Review

THE NATIONAL MAGAZINE OF SHIPPING
576 Sacramento Street, San Francisco
339 AT 30 CHURCH STREET, NEW YORK

J. S. HINES, Publisher
A. J. DICKIE, Editor
PAUL FAULKNER, Publicity Manager
BERNARD N. De ROCHIE, Business Manager

Official Organ of the Pacific American Steamship Association and the Shipowners' Association of the Pacific Coast.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879.

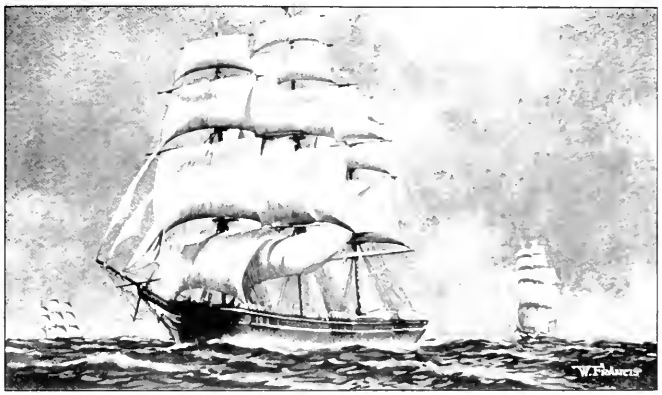
Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 20th.
Subscription price, a year (domestic)..... $2.00
(foreign)..... 3.00
Single copies ..... .25

DAVID CROCKETT, CLIPPER SHIP

The Second Installment of A Brief History of this Celebrated Vessel and Her Forty Years of Hard Service in the San Francisco-New York-Liverpool Run

By F. C. MATTHEWS

THE sixteenth passage of the David Crockett from New York to San Francisco was made in 113 days. She left her home port November 9, 1873; arrived out March 2, 1874. Captain Burgess reported 27 days to the line; 60 to the Horn; made the run from 50 to 50 in 12 days; 32 days after passing the Cape was on the equator, thence 21 days to port. Had light or moderate winds practically all the run except the first few days out from Sandy Hook and again off the California coast, on both of which occasions encountered heavy gales. Spoke no vessels whatever. After discharging her inward cargo she loaded wheat for Liverpool and was in the stream, cleared, and ready for sea on April 20, when the crew mutinied and the police being called in, sixteen seamen were taken into custody. This caused the ship's detention 5 days. She reached Liverpool August 10, a passage of 107 days. On June 25, off the Platte in a heavy gale, Captain Burgess was washed overboard from the quarter deck and drowned. The mate, John Anderson, took the ship into Liverpool and was appointed to the command, in which he continued while she was operated as a sailing ship.



From painting by W. Francis.
American clipper overhauling merchant ship at sea.

From Liverpool she crossed to New York, loaded for San Francisco, and crossed the bar outward bound November 22, 1874. The following day, in a very violent gale from the southwest, sails were split, cargo shifted, and a great quantity of stores stoved in the 'tween decks; ship rolling hard and straining; decks filled by heavy seas, and with the mast coverings torn from the main mast, considerable water got into the hold. On January 1, 1875, in 38 S., 43 W., 40 days out, she had a violent gale from the south, during which had bulwarks, cabin skylights and quarter boat stove, and the cabin and store rooms filled with water. Passed the Horn January 13, 52 days out; crossed the equator February 15, 85 days out, and after a fine run of 18 days, hove to in a thick fog 7 miles southwest of the Farallon Islands at 10 p. m., March 5, 103 days from Sandy Hook. The vessel entered port the following day, passage 104 days. The mate was off duty the best part of the run and considerable annoyance was had from the crew. Taking her departure from San Francisco April 11, 1875, she made the run to Liverpool in 116 days, arriving out August 5.

On the following passage, her eighteenth westward Cape Horn run, the David Crockett arrived at San Francisco March 27, 1876, 109 days out from New York. Crossed the line in 23 days from Sandy Hook and passed the Horn 59 days out; had fine weather down the Atlantic and off the Cape. Sailed from San Francisco May 30 with 44,744 centals of wheat; arrived at Cork September 27, 120 days' passage. On June 14, 1877, Captain Anderson had his charge again anchored in San Francisco Bay after a run of 113 days from New York. Had crossed out at Sandy Hook February 21; northeast trades were light and the line was crossed on the 26th day out; passed Cape Horn April 21, 59 days out; was 15 days between the 50's with very boisterous weather in the vicinity of the Cape;

crossed the equator May 19, 87 days out, and 13 days later, 100 days out, was within 800 miles of the Golden Gate, but light and baffling winds were then met, which spoiled what would have been a very fast passage. After discharging she was put on the berth for New York; sailed November 12 and arrived out February 24, 1878, 104 days. Loaded back for San Francisco; took departure from Sandy Hook April 2 and arrived out July 27, 1878, 116 days' passage. Had 20 days to the line and passed Cape Horn June 8, 68 days out; was 12 days from Cape St. John to Cape Horn with very violent gales from the southwest, and much snow and hail; was 20 days between the 50's; crossed the equator 22 days from the Cape, 90 days out, after which had light and variable winds to port. Sailed from San Francisco October 22; was 19 days to the line; on the 45th day out was up with Cape Horn; the following day met with a large number of icebergs, some 100 feet high; arrived at New York January 30, 1879, 100 days' passage.

On her twenty-first outward passage to San Francisco, the David Crockett left New York March 26, 1879, and on August 7 at 9 a. m. was close enough to Point Reyes to hear the fog horn. But calms and a dense fog delayed her arrival for 2 days, making her run 136 days. When 5 days out, in 38 north, 67 west, she encountered a fearful gale lasting 48 hours, the wind being all around the compass, but she got safe through with but very little damage; crossed the line 28 days out; passed Cape Horn 63 days out; took a fearful gale from west to southwest, which lasted 12 days with awful squalls of hail and snow and a very high sea; on June 9, 11 days later, had drifted back to Cape St. John; 2 chain plates of the main rigging and the gammon on the bowsprit were carried away and the main spencer and topgallant sails split. Captain Anderson stated that in his 14 passages round the Cape he had never seen such fearful weather before. She got past the Cape for the second time on June 11, 14 days after the first occasion, crossed the parallel of 50 in the Pacific 79 days out and was on the equator 23 days later; had very light trades in the north Pacific with a great amount of calms; was within 600 miles of the Golden Gate for 15 days. Completing this voyage she left San Francisco October 21 and arrived in New York January 30, 1880, 100 days' passage. Loaded for San Francisco and sailed from New York March 22; was 25 days to the line and passed Cape Horn May 26, 65 days out; having had very light winds in the south Atlantic; was 13 days between the 50's with fine weather coming round the Cape; had very light winds and trades in the south Pacific and did not cross the equator until 101 days from New York; in 12 north had to put the ship under lower topsails for 12 hours in a violent gale and when 400 miles from destination had a heavy gale lasting 2 days, during which had upper and lower fore-topsails blown to ribbons and 2 topmast staysails split. Arrived at San Francisco July 28, 1880, passage 128 days. Sailed for New York October 18 and arrived out February 11, 1881, 116 days.

On her twenty-third run out to San Francisco the David Crockett left New York March 22, 1881; was 22 days to the line; off the Platte, May 3, had a hard gale from southwest; May 20 passed in sight of the Cape, 60 days out; then took a violent gale from the west and for 6 days was hove to under lower topsails, drifting to the eastward; passed the Horn May 28 for the second time; was 14 days from 50 to 50; crossed the equator June 25, 96 days out, and had 28 days to port, arriving July 23, 124 days' passage. Sailed from San Francisco August 31, and arrived at New York December 8, in 99 days.

The following westward run was the poorest showing the David Crockett ever made over any course, and prior to her arrival at San Francisco July 27, 1882, in 157 days from New York, fears had been felt for her safety and by some she had about been given up for lost. Captain Anderson reported that the delay was caused by continued adverse winds and that he did not have a 36 hours' fair run on the passage; from the vicinity of the Platte to 40 south in the Pacific there was nothing but a succession of heavy gales. On May 30 and 31, in 45 south Pacific, had a fearful gale from the north and an awful sea; the bulwarks, cabin doors, deck house, and so forth, were stove, two chain plates parted and the reefed foresail, of new canvas, was split. Sailed from San Francisco September 3, 1882, and arrived at New York December 14, 102 days out. When 8 days from the Golden Gate, in 16 N., 117 W., had a hurricane from north to southwest, which took the lower topsails and topmast staysails clean out of the bolt ropes; she was pooped by a sea which washed away the binnacle, stove in the cabin windows, filling the cabin with water; started the upper part of the stern and set adrift the spare yards on deck, besides doing other damage. The gale lasted 20 hours and did such damage to the schooner Claus Spreckels and the ship Hope that they had difficulty in making Honolulu for repairs. The David Crockett, however, keeping true to her record, brushed herself off, and 11 days later crossed the line, 19 days out; on October 17, 44 days out, she passed Cape Horn and 34 days later crossed the equator in the Atlantic.

On her twenty-fifth and last passage out to San Francisco the David Crockett left New York February 10, 1883; had very light trades and was 36 days to the line; experienced very stormy weather in the south Atlantic; passed in sight of Cape Horn April 29, 78 days out; was 17 days from 50 to 50; was 18 days from 50 south, Pacific, to the equator, crossing May 25, 104 days out; found no trades until in 20 north, and thereafter had light winds and calms; was within 900 miles of San Francisco for 24 days; arrived June 28, 1883, 138 days' passage. Sailed from San Francisco August 22, and arrived at New York November 22, 92 days' passage. On this trip she doubled Cape Horn for the last time.

Early in the career of the David Crockett, probably about the time she became a regular packet between New York and San Francisco, she had been purchased by Lawrence Giles & Company of New York. That firm subsequently sold her to George Howes & Company of New York and San Francisco, who retired from business in the summer of 1880, being succeeded by John Rosenfeld of San Francisco, who also took over the Howes' fleet; this included such other well known ships as Young America, Black Hawk, Valparaiso, and General McClellan.

In 1883, after her arrival at New York on her last passage from the Pacific, the David Crockett was sold to Thomas Dunham's Nephew & Company, who later sold her to S. W. Carey, and she was operated in the Atlantic, latterly rigged as a bark. In May, 1890, she was purchased by Peter Wright & Son of Philadelphia, and after being towed to that port was converted into a barge.

She was ultimately lost, but details are not at present available.

(Continued on page 259)

SECTION 28

Much Difference of Opinion Between Ship Operators, Shippers, and Shipping Board as to the Outcome of the Enforcement of Section 28 of the Merchant Marine Act of 1920

SINCE the Shipping Board certified to the Interstate Commerce Commission that sufficient American tonnage existed to take care of American exports and imports on the Atlantic and North Pacific runs and that body issued an order enforcing Section 28 of the Merchant Marine Act of 1920 on and after May 20, 1924, there has been a great flood of written opinions filling all of our daily newspapers, the shipping weeklies, and various magazines. Such a wide difference appears in the statement on this subject made by competent experts that it ill behooves a layman to even hint at a solution.

We are printing herewith a statement made by Cary W. Cook, who is considered one of the shrewdest operating executives on the Pacific Coast, and also a statement compiled by Winthrop L. Marvin, recognized as an authority on maritime matters on the Atlantic Coast. The American Steamship Owner's Association and the Pacific American Steamship Owners' Association have both appointed strong committees to make a thorough study of the probable effects of this measure. Commerce Committee of the Senate is holding hearings, taking testimony, and a resolution has been introduced postponing the effective date of Section 28 of the Merchant Marine Act of 1920 until July 1, 1925.

It seems to us rather puerile to re-postpone for another year in order to study its probable effects, a measure whose enforcement has already been postponed for four years.

The best possible method of finding the effects of any measure, and possibly the only method, through which those effects will ever become known to Congress is the enforcement of the measure.

MORE OF SECTION 28

By CARY W COOK

I NOTICE that the merchant has finally had brought home to him a realization that at least one section of the Jones Bill has objectionable features not hitherto suspected. Those of us who are trying to build up privately-owned shipping have realized the handicaps imposed by the shipping acts of 1916 and 1920 but have not been able to make ourselves heard above the enthusiastic clamor of those who have had their imagination excited by war-time propaganda.

Since it is realized by communities (made up of individual taxpayers) that Section 28 is not all that fancy painted, perhaps these same taxpayers will be enough interested in other sections to demand the repeal of all of the shipping acts of 1916 and 1920.

It is no good railing at the Shipping Board. It is doing what any inexperienced body of men would probably do if directed by law to do something.

The total losses of the board in attempting to carry out the uneconomic mandates of the law were for the eighteen months ending December 31, 1923, more than sixty-two million dollars. This is the direct loss in operating the vessels and does not seem to include administrative expense or depreciation and care of the laid-up fleet. Congress has appropriated $30,000,000 for the next year with $6,000,000 more to cover increased fuel cost. This is only about $700,000 per week of the taxpayers' money.

The board is directed to establish new routes but it must not maintain them where a service is already being given by citizens of the United States unless the revenues are equal to the cost, including proper interest and depreciation. The intercoastal service was, and is grossly overtonnaged and yet the government maintained two lines at an admitted loss to the taxpayer of $924,250.

Grace maintains a line to West Coast, South America, and $93,913 of the taxpayers' money went for a competing government line.

Garland Steamship Company has put on a line trans-Pacific; Dollar has fortnightly sailings. The government has not yet announced the withdrawal of its lines, which in eighteen months cost the taxpayer $6,229,981, plus feeder service, $284,428.

Oceanic Steamship Company has operated for years to Australia; we have not heard of plans for expansion. The government competes at an admitted cost to the taxpayer of $631,373.

All these are home matters with which your readers are familiar. The balance of the $62,176,156 may be for similar illights elsewhere, except for $983,419 on the combined tanker fleet.

The laws referred to authorize and direct the Board to sell as soon as practicable, consistent with good business methods, all of the vessels under its control. A prospective buyer must be brave indeed to assume the responsibilities incident to shipowning if he buys from a competitor with an immense number of idle ships and the full resources of the American taxpayer behind him and with authority over the buyer's method of conducting his business.

A private owner using "good business methods," finding himself with these surplus ships on hand and no profitable trade and no knowledge of the business, would no doubt make the most economical arrangement he could for the care of the ships and lay them up, advertise them for sale or charter at market rates and covenant with the buyer or charterer that he would not himself, directly or through agents, operate those unsold; that he would allow the buyer to operate them when and how he pleased without hampering and unnecessary regulation.

These are only a few nigh lights on the shipping act of 1916 and the merchant marine act of 1920. If any person likes more information let him get copies of the two acts and wherever the word "vessel" occurs let him delete that and insert the word "wheelbarrow" and the full wisdom of these two laws will be apparent. Then let him look up the copy of the statement he made to neighbor McLaughlin on March 15.

DISCRIMINATIONS AGAINST U. S. SHIPS

A Statement Compiled by the American Steamship Owners' Association

Practically every American who reads the newspapers is familiar with the disputes that arose out of the British attempt to corner the sea freight on Egyptian cotton from Alexandria to United States ports.

Few, however, realize the strength of the nationalistic feeling among European nationals on the subject of patronizing home tonnage.

This statement, compiled by Winthrop L. Marvin, manager of the American Steamship Owners' Association, reveals a few of the directions in which this spirit hampers the American merchant marine in getting legitimate business.

SOON after the armistice a new American steamship line was established by cooperation between the Shipping Board and an old and experienced American shipping company, from ports of the Atlantic Coast to ports of the west coast of Africa. The first steamer of this new American line found on her arrival at a certain British Colonial West African port that a very formidable defense had been prepared for her reception. All the British ships in the harbor were secured at the most eligible places of discharge. At the other piers there were moored all the lighters in the harbor, that had been filled with stone and thus placed for the express purpose of crowding out the American ship. The American master, being a man of resource, promptly lowered his life-boats to land his cargo on the beach, if necessary. Then he went ashore and had an interview, first with the agent of his line and then with the British Colonial governor. As a result of what was then said and done, tardily and with poor grace a place was made alongside a pier for the American steamer, which was thus enabled to discharge. The carrying trade from the United States to the port in question had been long controlled by the Elder-Dempster Steamship Company.

In June, 1922, formal complaint was made to the United States Shipping Board by American exporters of American grain against "the discrimination shown by the Scandinavian and especially the Swedish grain trade against the American vessels." There had been inquiries for ten shiploads of wheat to be shipped to Sweden. The American steamers quoted a freight rate on this wheat of 22 cents per 100 pounds, a lower rate than was being asked by Scandinavian steamers. But the Swedish houses insisted on the use of Swedish ships, even at higher cost of freight, which ultimately came back to the American farmers who produced the grain. It was urged in this case "whether or not some retaliatory measure should be taken against Swedish steamers plying between this country and Europe," so that American ships might secure a fair, equal chance. It should be borne in mind in this case, as in many other cases, that American ships were prepared to transport grain to Sweden at a lower rate than Swedish shipowners were demanding.

But Sweden is not the only country which endeavors to enforce discrimination against the American flag. In September a quantity of copper was available for export from Baltimore. The British house to which this copper was consigned demanded that all but fifty of our two hundred and fifty tons be sent in the ships of a British company, though the freight rate of American steamers was the same and abundant American tonnage was available.

About the same time a quantity of standard flour was to be shipped to Scandinavian ports. American ships were ready. Their rates were acceptable, but this American flour was sent by a Scandinavian ship because Scandinavian houses so demanded.

Americans "Excluded"

In August, in another case, inquiries for American grain for a Swedish port were received, but it was stipulated in these inquiries that "American steamers must be excluded."

In the same month a shipper of lumber through Hampton Roads to the United Kingdom was asked why he never sent any of this American lumber in American bottoms, and the reply was that he was "compelled by some external interests to favor the British lines."

In this same month of August, Chicago shippers of American flour reported on a boycott of American steamers by orders from the other side. But these flour exporters stated they were fighting such sharp discrimination against the American flag, and were making progress in breaking down such discriminations. These exporters insisted to the foreign houses that the American flag steamship services were fully reliable, that they must be supported if both the buyer and seller of flour were to continue to enjoy the 5-cent differential, and that finally c. i. f. (cost, insurance, freight) basis the shipper should have the privilege of controlling the routings.

Manchester Control

Manufacturers and exporters of steel nuts and bolts through Philadelphia to Manchester, England, report that foreign houses insisted on controlling the routing of their shipments through a representative in Liverpool who favored the British lines. At the same time, Michigan lumber manufacturers declared that the same discriminatory methods were being applied to their exports of maple flooring.

In the latter part of July an American firm at Baltimore, offering 600 tons of heavy grain to Norwegian buyers, at a freight rate of 17 cents per 100 pounds, received a cable reply insisting that the grain be loaded on a Norwegian steamer, although the freight rate on this steamer was 20 cents per 100 pounds. In this case the owners of the Norwegian steamer finally consented to meet the rate of the American steamer, and got the grain.

The same American house cabled to several Norwegian ports offering grain by this same American steamer, "and in each instance except one the replies received stated plainly, 'American steamers excluded,' although the rates were even lower than rates by foreign steamers."

On exports of malt, cables and letters from the other side insisted that the merchandise "must reach Norway in Norwegian ships."

An American steamship company with privately-owned tonnage offered space for malt to Rotterdam and Amsterdam at 25 cents per 100 pounds. In reply came a cable message that the malt must be sent by

Holland-America ships at a rate of 30 cents per 100 pounds, the Dutch houses insisting on the use of Dutch ships, "no matter what the rate by the American lines." This reply is in the hands of American merchants.

In Belfast, Dublin and other ports of the United Kingdom, agents of the British lines urge grain buyers "to accept no other boat than a British steamer." "There have been cases where the American boat has quoted a lower rate than the British, but the grain must go by British bottoms."

American exporters who furnish this information state that "there seems to be a high-handed foreign propaganda to drive American shipping out of foreign trade. All sorts of complaints and excuses are used to discourage the use of American ships, and it is the writer's own opinion that the question of insurance is part of a well-conceived campaign against American shipping."

"Forward by British Lines"

Secretary Hoover's Department of Commerce at Washington, in Commerce Reports of October 22, 1923, quoted this declaration from an important purchaser of American products:

"A British firm placing an order with an American company says: 'We shall be glad if you will make a special note **always to forward our goods in the future by the Cunard or other British lines sailing between New York and England.**'"

On this significant declaration against the American merchant marine, the Department of Commerce comments that "Without reference to rates or services, this British firm wants its goods shipped in British vessels. Americans certainly should be willing to support American shipping lines when rates and services are equal."

It should be particularly noted in this connection that the Cunard Steamship Company, on whose behalf this boycott of American ships is invoked by this British merchant, is a leading member of the Liverpool liners' conference by which the complete boycott of American ships at Alexandria was enforced so long against the protests of our shipowners and our government.

British Exporters

A recent canvass of British manufacturers and exporters from one of the chief commercial districts of the United Kingdom, which annually sends immense quantites of manufacture to this country, brought from fourteen out of sixteen of these gentlemen a frank declaration that they would not ship to the United States in American vessels under any circumstances; some of them proclaimed that they would hold their goods a month for a British ship, if necessary. As a result of this organized discrimination against the American flag, it may be said that large American steamers, with a capacity of 9000 or 10,000 tons of cargo, have left a port of that particular district westbound to American ports with as little as fourteen tons of cargo!

These specific instances of deliberate discrimination against the use of American ships, even when these American ships offer lower freight rates for the export of American grain, lumber and other commodities, and of discrimination also against the use of American ships for the import of commodities, cover many ports and many trades, and are unquestionably indicative of a determination to force the American flag off from many of the trade routes of the world. It is vitally important that the American people should know that these methods of merciless discrimination are proving effective. In April, 1920, 40.59 per cent in value of the imports into the United States and 47.70 per cent of the exports from the United States were being conveyed in American vessels of private or government ownership. In January, 1924, the proportion of our imports carried in American vessels had sunk to 31.72 per cent in value and of our exports to 38.55 per cent.

Discriminations General

These foreign discriminations are being enforced not merely against Shipping Board vessels, but against all American vessels regardless of ownership. It is to be observed that in most cases they are matters not of foreign governmental law or regulation, but of agreements and understandings among foreign importers, exporters and steamship companies; and that, therefore, it is urged that they are not in conflict with any formal commercial treaties, which relate only to governmental action. These discriminations are being applied not to a limited group of articles, as is proposed in Section 28, but to all articles of export from or of import to America.

Without pronouncing specific judgment on this section, it must be obvious to all men that unless, with the common consent of our railroads, of our shippers and of our Congress, some effective method of dealing with these widespread discriminations against American shipping is speedily found, the American merchant marine in a few years will be as effectively driven from the ocean as it had been by similar methods, aided by low foreign wages, subsidies and bounties, at the outbreak of the world war in August, 1914, when less than one-tenth of the imports and exports of the United States were being conveyed in vessels of the United States.

Summary—Close Sailing Records

(Continued from page 256)

A summary of the Cape Horn passages made by the David Crockett, outward and homeward, as compared with those made by the Young America over the same courses, show such phenomenally even sailing records that neither may be said to have had an advantage.

The total number of days consumed on David Crockett's outward twenty-five runs was 2985; average 119.4 days; fastest 103 days; slowest 157 days; passages of 110 days or under 8; average of same 107.12.

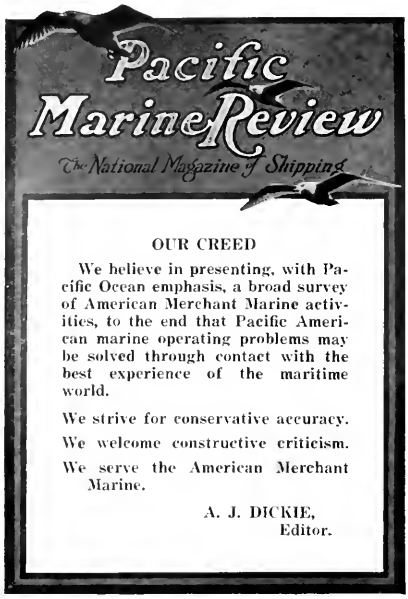
Young America's total days on twenty-four outward passages was 2864½ days; average 119.31 days; fastest from Liverpool 99 days (record); fastest from New York 102½ days; slowest 151 days (to Portland). She made seven runs of 110 days or under, averaging 106.3.

The David Crockett's total days on twenty-three homeward passages was 2364; average 102.78; fastest 88; slowest 120. She had nine passages of 99 days or under, which averaged 94.55.

Young America's total days on twenty homeward runs was 2047 days; average 102.35; fastest 83; slowest 125; seven passages of 99 days or under, which averaged 92.57.

It must be remembered that on all these voyages the ships had full cargoes and it is therefore a question if they are not entitled to greater credit than those clippers which hold the eastbound record but which went over the course in ballast trim.

The David Crockett's best time from New York to the line was 19 days; to 50 south, Atlantic, 47 days; to 50, Pacific, 57 days; to equator, Pacific, 74 days; from 50 to 50, 8 days; from 50, Pacific, to equator, 16 days; from equator, Pacific, to Farallon Islands, 18 days; and into San Francisco Bay, 19 days; from equator, Atlantic, to Sandy Hook, 18 days.



American Shipbuilding

THE past month has brought to American shipyards a number of new contracts. These include two first-class passenger coastwise liners, three passenger and automobile ferries, one passenger and cattle steamer, one large Lake-type bulk freighter, two self-propelled oil barges, one combination freight and passenger steamer for the Potomac river, seven carfloats for New York harbor, besides a large fleet of yachts, motorboats, workboats, and tugs for bay and river use.

Inquiries by ship operators are active enough to keep American shipbuilders busy figuring. There are several prominent lines considering seriously the need of new special types to meet their individual needs, and the prospects for a fair amount of new construction are very bright.

For our well-established shipyards it must be very discouraging to see work that should be done here going to Europe. Especially is this heartbreaking in the matter of fine motor yacht construction. Surely, it is not commercial necessity that drives our sporting millionaires to Denmark and Holland with contracts for building new yachts, when there are many yards in the United States fully capable in experience and equipment to turn out an equal or superior product.

The removal of the luxury tax on this class of vessels will help this situation, but there should be some method of applying a stiff tariff on such construction at first arrival in an American port. If such tariff is at all defensible when applied to foreign repairs on American merchantmen, it should most certainly be imposed on foreign construction of American yachts.

Use American Ships

ON another page of this issue will be found a formidable listing, by an American authority, of so-called foreign discriminations against American ships. On analysis these are found to be very largely spontaneous demonstrations by foreign nationals not against American ships per se, but in favor of their own flag ships.

American shippers and the American traveling public should take a lesson from the maritime patriotism of other maritime countries and should use American ships whenever and wherever possible.

It is very discouraging to see American Bar Association, American Society of Naval Architects and Marine Engineers, and even prominent American ship surveyors and ship owners using foreign flag passenger liners for their personal and family transportation.

There are always, of course, two sides to every problem and we have known instances of American exporters and importers favoring foreign bottoms, when we have suspected that there might have been good reasons for a great deal of this lack of patriotism.

The great bulk of overseas carriage of American exports and imports in American bottoms is at present under direct or, as Chairman O'Connor puts it, eighty-five per cent direct control of the Shipping Board. There have been quite a few claims presented against the Shipping Board both in American and foreign courts, and Shipping Board has often escaped by invoking the doctrine of immunity as a sovereign state. This situation will probably be cleared up in the course of time by an international agreement. But in the meantime, let's settle on equity, not on privilege.

Why not make our American merchant marine safe for American and all other sea shippers?

COMPARISON OF MATERIAL AND LABOR PRICES AND SHIPBUILDING COSTS 1914 TO 1924

Item	1914	1924	% Increase
Steel, base Pittsburgh 100 lbs.	$1.20	$2.50	108
Freight rate, Pittsburgh to New York	.16	.34	112½
White pine, joiner work, per M.	60.00	180.00	200
Cypress " " " "	60.00	150.00	150
Oak " " " "	110.00	180.00	63½
Long leaf yellow pine decking, per M. (Lumber prices for carload lots)	35.00	100.00	186
Paint, average per gallon	1.25	2.60	108
Large forgings, per lb.	.15	.25	66⅔
Cast iron, " "	.02½	.06	140
Cast steel " "	.04½	.10	122
Labor, mechanics rate per hour	.35 - .40	.65 - .70	85 - 75
Labor, common, " " "	.17½	.46	126
10,000-ton Freighter, cost per deadweight ton	$60.00	$105.00	75

The above list of comparative costs of labor and material in shipbuilding operations and the average contract price for 10,000-ton freighters was submitted by a prominent Atlantic Coast shipbuilder.

Rules to Govern the Awarding of the American Bureau of Shipping Annual Educational Prizes

THE board of managers of the American Bureau of Shipping at their annual meeting held in January, 1924, voted to establish a system of cash prizes for scholarship at the various American institutions where the subjects of naval architecture and marine engineering are taught. The following rules have been adopted to govern the award of these prizes:

1. The prize shall consist of $100 in gold.

2. A prize shall be given annually to the student qualifying at each of the following institutions:

   a. Cornell University.
   b. Lehigh University.
   c. Massachusetts Institute of Technology.
   d. University of California.
   e. University of Michigan.
   f. Webb Institute of Naval Architecture.

Other institutions may be designated, when qualified under the terms of the award.

3. No award will be made to any student who is not an American citizen.

4. No award will be made to any student whose conduct and general standing is unsatisfactory.

5. As the early part of college courses is largely devoted to general education, the basis of the award shall be the highest average for the last two years of the course, in the regular prescribed subjects. Electives are not to be included in these averages.

6. Students who may come from other institutions and take the last two years of the courses in naval architecture and or marine engineering may be considered as eligible for the award.

7. For the best interests of all concerned, holders of similar prizes or scholarships should not be considered as eligible.

8. The faculty of the institution, or a committee of the main faculty having jurisdiction over the courses involved, shall be the determining agency in selecting the student to whom the award is to be made, governed by the general rules herein set forth. Any minor questions in connection with the award shall be decided by the committee of each institution having charge.

9. It is requested that the student who is to receive the award shall be selected at least two weeks before the graduating day, and notification of the selection made is to be forwarded to the president, American Bureau of Shipping, 50 Broad street, New York City, immediately after the selection is made.

10. The awarding of these cash prizes shall become effective for classes graduating in 1925, and the award in each case to cover scholarship demonstrated in the two college years preceding.

The Spectrograph Aids Marine Standards

WHILE the Bureau of Standards was engaged in researches in the science of spectroscopy a problem came up. A steamship had been lost by a boiler explosion. In such boilers there had been placed a safety plub which was supposed to melt at certain temperatures, forming one of the conditions preceding such an explosive point The safety plub had apparently failed. "Why?" the bureau was asked.

The spectrograph revealed that plugs which were supposed to be of pure tin contained a trace of lead, zinc, and other metals in some cases. Pure tin melts at a temperature of 232 degrees centigrade. The presence of lead or zinc or other impurities caused the formation of a compound which required a very high temperature for melting. The reason was clear. Hence the spectrum analysis had been applied in a rapid and convenient manner, and an optical method could supplant a more complicated chemical test. The bureau then developed specifications and methods of test to eliminate further accidents from this source. In the case of a Middle Western manufacturer, whose factory made high pressure valves, leaks were discovered. Again the Bureau of Standards was asked "Why?" Mr. Meggers and his assistants took some of the material used and the spectrograph revealed the presence of aluminum in the alloy in a degree unfavorable to high pressure work.

Not long ago the spectrographic method revealed its accuracy in checking up the Bureau of Standards itself. Standard samples of vanadium steel had been prepared and sent to various ports. Word began to come back that these "standards" showed traces of tin. At once an exhaustive check-up was begun. The operations were carried on to the point of boiling down some of the chemical reagents used in preparation of the samples. A tiny scrap of residue was found, not larger than the head of a pin, too small for chemical analysis. Use of the spectrograph disclosed that there were eleven chemical elements in this tiny speck, and that the most prominent was tin.

In preparing purity standards of platinum, rhodium, iridium and palladium, the spectrograph has again been used with success; and it is declared that the chemical knowledge of these unusual metals is as yet so unsatisfactory that this method is the only safeguard.

Trade Balances

HERBERT HOOVER is performing a very useful service to world traders in his annual analyses of our World Trade Balances. The second of these summarizing conditions in 1923 is the subject of a bulletin recently issued by the Department of Commerce.

The bulletin shows that the exported $4,208,000,000 worth of goods and imported $3,819,000,000 worth of goods. There was thus a balance in our favor on the movement of goods of $389,000,000. Parallel with this movement of actual commodities were what have been termed in this summary the "current invisible items," amounts paid out in foreign countries through our tourists, through remittances of immigrants, through payments for foreign shipping and services of one kind or another, a total of $1,162,000,000. On the other hand, we received interest on money owed to us by foreign investors and by foreign governments, together with payments for the use of our ships by foreigners and expenditures of foreigners in the United States amounting to approximately $792,000,000. Therefore, on these items of current invisible exchange we had a net balance against us of $370,000,000.

If at this point we deduct the favorable balance which we received on our merchandise business, we

find that from items of merchandise and current invisible exchange our favorable balance is reduced to approximately $19,000,000.

Freedom of the Air

IN the course of a recent statement made before the Committee on Merchant Marine and Fisheries, David Sarnoff, vice-president and general manager of the Radio Corporation of America, made some very interesting observations as to the possibilities of radio broadcasting.

Mr. Sarnoff is always optimistic in his outlook, and it is very refreshing to read his eloquent plea for the freedom of the air lanes. In reference to the financing he remarks:

"It has been said by a great many people and a great many corporations, some very large and able, that broadcasting depends upon a solution of the problem whereby the consumer will pay for the entertainment which he receives. In other words, it has been said that unless some method is provided whereby a means is created for collecting revenue from the user of a broadcast receiver, that the whole industry is founded on sand, it is bound to collapse in time, because there will be no means of supporting it.

"I want to go on record very definitely today in saying to you that it is my firm conviction that that sort of solution to the problem is not necessary; that broadcasting can be made commercially practicable without any means being found for collecting from the consumer; that the greatest advantage of broadcasting lies in its universality, in its ability to reach everybody, everywhere, anywhere, in giving free entertainment, culture, instruction, and all the items which constitute a program, and in doing that which no other agency has yet been able to do; and it is up to us, of the radio art and industry, with intelligence and technique and broadness of spirit and vision as to the future, to preserve that most delightful element in the whole situation—the freedom of radio."

Mr. Sarnoff proposes to make this possible by the use of national programs sent out from superpower stations and relayed from local broadcasting stations, these latter to add special programs to meet local conditions and the cost to be met by a small tax on the radio industry.

Continuing the argument for free radio, Mr. Sarnoff pledges his firm as follows:

"Whatever legislation this Congress may enact that is in the public interest and that will not hamper the strides that have already been made in this country, as compared with the slow progress of Europe, will be wholeheartedly supported by the Radio Corporation.

"I cannot help feeling that not only should be public be left free from the payment of any license fee to the government or others for the privilege of listening on a broadcast receiver, but that it should also be free from fees or tolls of any kind in the field of broadcasting through space. Furthermore, I believe that the expressions of educators and statesmen should reach them uncensored and uncontrolled. The air belongs to the people. It should be regulated by the will of a majority of the people. Its main highways should be maintained for the main travel. To collect a tax from the radio audience would be a reversion to the days of toll roads and bridges; to the days when schools were not public or free and when public libraries were unknown."

Radio Prize Offered

THROUGH the generosity of an anonymous donor, a cash prize of $500 is offered by the American Radio Association for the best answer to the question, "Who is to pay for broadcasting?"

The terms of the contest require that all answers shall have been placed in the mail addressed to the American Radio Association on or before July 20, 1924. The contest is open to any resident of the United States without regard to sex or affiliation with the radio industry. Contestants are requested not to exceed fifteen hundred words in their statement of any one plan, which should be typewritten and double spaced. In addition to the plan itself a brief summary should also be included. In the possible event of the same plan being received from two different sources, the board of judges will be requested to award the prize to the first one received according to the postmark on the envelope.

All statements of plan should be sent to Alfred M. Caddell, secretary of the American Radio Association, 50 Union Square, New York City.

Anti-Fouling Paint

IN connection with an article entitled "Keep Hulls Clean," which was published in the March, 1924, issue of Pacific Marine Review, we have recently received a communication from the Emergency Fleet Corporation of the United States Shipping Board supplying us with additional facts concerning the condition of the steamship Hog Island and concerning the variation in her fuel consumption. We are glad to quote this letter herewith, so that readers of Pacific Marine Review may be able to arrive at a satisfactory conclusion in regard to the practice of the Shipping Board in the matter of bottom paints:

"The contributor of the article in question attacks the Shipping Board standard paint on the basis of the increase in the fuel consumption on the steamship Hog Island. He selects voyage number 9 of the vessel as showing less fuel consumption, and it may be of interest to point out here that voyage number 9 was begun after the vessel had been out of dry dock for nine months. He then goes on to say that voyages number ten and number 11 were made at reduced speed and increased fuel consumption and casts aspersions on Shipping Board management for allowing the vessel to make voyage number 11 without dry-docking. It is interesting to state that voyage number 10 was begun twenty days after the vessel came out of dry dock, and voyage number 11 began four months after dry-docking. Obviously then the article is based entirely on assumption, for the increased fuel consumption could hardly be charged to the bottom in such a short period and, as a matter of fact, upon each docking of this vessel we have found the bottom in a satisfactory condition. It is pertinent to remark that at no time in the past have the bottoms of Shipping Board vessels been in so satisfactory a condition as at present. Furthermore, the bottom paint which we are now using is satisfactory for ships operating on all routes, and as a matter of fact is of a higher standard than is generally required for the northern routes."

Pacific Marine Review

FROM BATTLESHIPS TO SHINGLE NAILS

Some Interesting Avenues Through Which the Scraps of Our Former Fighting Ships are Being Made Useful in Peace-time Industries

By A. J. DICKIE

INSPIRED by Divine wisdom, the old Hebrew Prophet Isaiah visualized a time still to come when "the lion and the lamb should lie down together . . . they would no more hurt or destroy . . . The Prince of Peace would come to reign in the hearts of men," and they would "beat their swords into ploughshares and their spears into pruning hooks."

Prophets like unto Isaiah need no material fulfillment to bolster up their faith, and yet we doubt not that much comfort has been brought to the spirit of the "Princely Son of Amos" in the course of the world's history since His sojourn on its surface. Certainly He could see much beating up of the implements of war into the tools and fittings of peace-time industry.

Former United States battleship at sea, as she was

Thoughts like these kept pressing on the mind of the writer as he was privileged to see a small part of the remarkable transformation through which the present scrapping program is forcing many of America's most famous fighting ships.

At the old shipbuilding plant of the Union Construction Company, Oakland, California, a number of these former dreadnoughts have recently been cut up into conveniently sized chunks by the use of cutting torches. Conditions at this plant are ideal for this work. Hulls are towed alongside the outfitting dock to a point where they are lightly resting on the mud at high water. As the material is cut away from the superstructures and the upper decks, the hulls float up and are pushed a little inshore. The dock is served by cranes of ample capacity to take care of the lifting required and as fast as material is cut away it is loaded on to barges or cars to be shipped to the best market for scrap.

Much of the battleship material loaded on barges is towed directly to the steel mills at Pittsburgh, California, on Suisun Bay, the upper arm of San Francisco Bay, where it is piled in the scrap yards of the Columbia Steel Company.

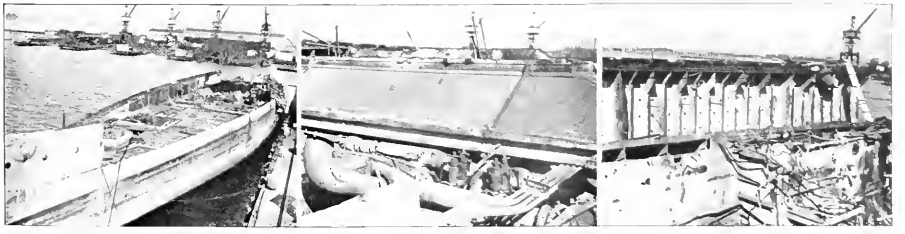
From the scrap piles the steel is carried by small cars to the charging floor of the open hearth furnaces. These furnaces are working steadily on a schedule of a heat poured every nine and one-half hours. Ladles, full of molten steel, handled by overhead traveling electric bridge cranes, are shifted across the floor immediately in front of the furnaces, and their contents poured into ingot molds. When the ingots thus formed have set they are stripped from the molds and taken to the furnaces at the mill. These furnaces are of the continuous heat type, oil fired. A continuous procession of cold ingots goes in at the charging end and is taken out at the mill end ready for the run through the mill.

At the time of our visit the output was principally in wire and wire nails. In the process from ingot form to wire nails, the flow of material would follow this order:

Ingot into rod mill; rods into shears to be cut into suitable lengths for rod furnace; through rod furnace to wire mill; through wire mill to coiling machine; from coiling machine as wire coils through pickling and cleaning vats to wire drawing bench.

On the wire drawing bench the material is drawn through dies to wire gauge sizes and goes to wire stock or to the nail forming machines. From the machines the nails go to the cleaning tumblers, and thence to the keg filling machine, or to the bins, either directly or, in the case of cement coated nails, through a dip tank and drying oven.

Such, in very brief outline, is the process now going on of "beating" battleships into shingle nails and arm-



United States battleship being cut down at the plant of the Union Construction Company, Oakland, California.

Some scraps of armor plate.

ored cruisers into steel wire. By this process it would be easily possible to convert 100 tons of battleship into something less than 100 tons of wire or wire nails within a 24-hour period. As a matter of actual practice, of course, any given piece of battleship may take several weeks or even months to become a certain number of kegs of nails.

Standing in the visitors' gallery overlooking the wire mill and visualizing the familiar forms of such ships as the Oregon, the Brooklyn, the Olympia, we are carried back to those tense days of the Spanish War when the famous "Bull Dog" of the Navy just out of the builder's hands, an efficient, powerful, fighting machine, was making her long dash round the Horn to join the fleet at Santiago. There in company with the Brooklyn she won great fame as did the Olympia at Manila Bay.

And now we are watching long white hot strips of metal rushing with ever-accelerated speed through the mill rolls—the fighting tops conning towers, turrets, guns, decks, framing, and plating of our former floating fortresses—to be formed into wire springs for a folding camp bed, net to trap the lordly salmon on the Alaskan coast, guide for electric communication, fence for pacture and field, aerial for a radio set. The speculation is endless, but we are intrigued; and so we go into the nail mill to see the bull dogs of the Navy put through the bull-dozers of the nail-forming machines.

Here we find all sizes and types of wire nail. Long slender nails with a thin flat head, coated with cement for extra holding power, make more practicable the light wooden containers in which California's fresh fruits and vegetables are distributed to the world. Short heavy galvanized stubs with wide-brimmed top for securing paper and composition roofing, eight and ten penny common for every man's daily use, from "bachelor buttons" to dog houses, spikes for railroad or bridge builder, brads, tacks, finishing and flooring nails, shingle nails, corrugated nails of all sizes flowing in an endless stream from the scrapped battleships to the channels of trade and industry.

It is a rather pleasing thought that the same steel which through stress of storm and battle afloat has grown old in the country's service, shall now be given a good billet ashore, and, as a fastening in the rooftree of some humble cottage or splendid mansion, shall still guard from danger the lives and property of its country's citizens.

Here is a nail—let's say a twenty penny common—driven into and fastening together two rafters at the ridge of a roof in Denver, Colo. The house carpenter drives it home, covers it with the sheathing and over that the shingles, tiles, or composition roofing, and it is lost to sight and mind for twenty years. That nail in the past twenty-five years of its existence might have been in the topmost layer of the prow of the proudest battleship in the United States Navy. It has watched the sunlight play on the waters of the Golden Horn; it has breasted the storms of all the oceans; shrouded in bunting, it has listened to the great ones of the earth pay their tributes of respect to the flag it has served; cleared for action, it has threaded the mine field on a hostile shore, faced the mysterious peril of the submarine, or come to grips with the enemy fleet.

Oh! you landlubber dweller in the frame house of the future, when you shall hear in the wild winter nights the creaking and groaning of the gables and ridges of the roof over your head, will you recognize the old call of the sea and give a thought to the brave ships and the braver hearts that will be even then as they are now and ever have been, fronting the dangers and meeting the difficulties of ocean transport to bring you life's comforts and necessities or of ocean defense to give you safety, confidence and strength!

SOME LIGHTHOUSE HISTORY

Sands Point, New York

THE following very interesting information is taken from the latest "Lighthouse Service Bulletin," issued monthly by the Lighthouse Service. With the sale of Sands Point Light Station on January 31, 1924, including the site and all the buildings, this old aid to navigation, established in 1809, passed out of existence. The site consisted originally of about five acres and was purchased in July, 1808, by the United States. The tower, built of freestone laid in courses and octagon in plan, and the old wooden building were completely remodeled in 1868-69, the tower being rebuilt and the dwelling reconstructed of brick and connected by a passageway with the tower. From the earliest times the site has been subject to erosion by the sea and to damage by gales, and many protective works were built, destroyed, and rebuilt in efforts to hold the station. The interests of navigation also required that the light be rebuilt on the outer end of a rocky reef extending northward from Sands Point about 800 feet offshore from the old light. The light at the old location had become of very little use to mariners. Accordingly, an unwatched acetylene light on a skeleton tower secured to a concrete foundation was established at the new location on December 15, 1922, where the aid will be of greatest service to navigation. This also results in a considerable economy in the future cost of operation of this station. It is interesting to note that this property cost the United States about $512 and was sold for $100,000.

Sandy Hook Light

The most interesting structure on Sandy Hook, and surrounded by the more modern buildings of Fort Hancock, is Sandy Hook Light, the oldest original lighthouse in the United States, and said to be the second oldest on the Western Hemisphere. It is a white stone tower, 85 feet high, and shows a third order fixed white light visible 15 nautical miles. It was erected at the instance of New York merchants for the protec-

(Continued on page 270)

TRADE AND TRAFFIC TRENDS

A Department Devoted to the Interests of Exporters, Importers, and All Ocean Shippers

SELLING AT OUR BASE OF SUPPLY

By FRANK R. ELDRIDGE

SELLING to people who supply us with raw material is not essential to balance our international transactions, but it is highly desirable. Ten per cent of our total imports last year, or $336,657,063 worth, came from India and Mayalsia. This was a 50 per cent increase over our 1922 imports from this region. On the other hand, we sold only 1 per cent of our total exports, or $49,691,857 worth, to this territory. In 1922 these same countries sold Europe $631,000,000 worth of raw materials and bought $696,000,000 in manufactured goods from Europe, a balance of imports from Europe of $65,000,000. In the same year these colonies sold the United States $240,000,000 worth of raw materials and bought $64,000,000 worth of manufactured goods from us, a balance of exports to the United States of $176,000,000.

This balance of imports into the United States from Europe's colonies in Asia tended to offset, in our total trade balance, our excess sales to Europe. In other words, in 1922 we received and credited to Europe's account the proceeds of $176,000,000 in excess raw material imports from Europe's colonies. In the same year Europe used $65,000,000 of this colonial credit, which we passed over to her in the excess of our merchandise exports, to finance the net excess of her sales over her purchases from her colonies. This left, however, $111,000,000 of the sum which we transferred to Europe as a contribution in goods from Europe's colonies transferred through us to Europe in our three-way commercial transactions. A further analysis shows that Europe made a net excess shipment of gold and silver to the colonies in 1922 amounting to $134,000,000. This did not go into circulation in India and was largely hoarded.

Our problem, therefore, is to make this treasure (which we have a hand in providing India with) an active factor in raising the standards and purchasing power of these oriental people, so that they will use their silver, once they acquire it, to buy more American specialties, which to them are luxuries, rather than bury it in the ground. This can be done through cooperative investment on our part in constructive enterprises in this region, such as will draw out these boards of silver and put them to work. If we are willing to participate with Indian capital in such investments it will mean greater use of our iron and steel, machinery, electrical apparatus, and agricultural implements, thereby raising the purchasing power of the people through greater productivity and increasing our sales of other specialties to them.

We are directly responsible for creating, through our demands for oriental tropical products, a surplus of wealth in Europe's colonies in the Far East, which is not put to any constructive use. These colonies need all the modern industrial, sanitary, and agricultural improvements that are so common among us and have raised our standards. Through cooperative investments with the holders of this hoarded wealth we may supply this need, and at the same time increase the sales of our specialties to these countries.—(Commerce Reports.)

ARBITRATION IN WORLD TRADE

FREQUENT misunderstandings between principals over contracts involving large amounts and the long delays occasioned by settling such disputes through the cumbersome processes of international law, led to the establishment of a Court of Arbitration by the International Chamber of Commerce.

A number of recent cases illustrating the effectiveness of the methods used by this court: One, a dispute involving $300,000, growing out of the sale of rubber by a Hollander to a broker in England for delivery from Batavia to a firm in New York, was disposed of at a three hours' sitting in Paris, to the satisfaction of all the parties to the case. In another, involving 750,000 francs, the disputants arrived at a full agreement after a three-hour debate before the administrative commission of the chamber. Another case was settled by arbitration sixty days after submission, the total cost of the proceedings being less than $300.

Other cases have shown that the mere existence of the machinery of adjustment provided by the International Chamber is sufficient to bring about or pave the way for an adjustment. Sometimes a mere study of the documents involved in the controversy is sufficient to procure the adjustment of the dispute.

In order that advantage might be taken of the machinery provided by the International Chamber the

Modern transportation a thousand miles inland on a Chinese river.

Court of Arbitration recommends the insertion of an arbitration clause in all international contracts. The suggested clause reads: "The contracting parties agree to submit to arbitration in accordance with the arbitration rules of the International Chamber of Commerce, the settlement of all disputes in connection with the interpretation or execution of this contract." Through the International Chamber and the National Sections experts familiar with trade practices are promptly available as judges.

Banking institutions and trade associations in the United States, aware of the advantage of this method of settling international trade disputes, are now urging their clients and members to incorporate the clause recommended in all foreign contracts in order that use may be made of the machinery provided by the Court of Arbitration.

TRADING WITH JAPAN

By an American Attorney Resident in Japan

A BUSINESS man entering Japan is interested primarily in getting business, but there are other considerations which the prudent business man must look into so that his profits do not vanish. The first of these is the question of taxes. The principal taxes are income, municipal, and business. The income tax is based on profits with regard to capital employed and certain exmeptions are granted. The municipal tax is a certain percentage (which varies from year to year) on the income tax. The business tax is based on the turnover and varies according to the kind of business carried on.

All foreign companies having an office in Japan are supposed to register it and also the representative; otherwise, in case of a suit difficulties are bound to follow.

Contracts Should be in English

In preparing contracts it is advisable to make them in English, with a translation attached, in which should be a notation that in case of a dispute or misinterpretation the English shall control. The advisability of this is that the American firm has something it can understand.

In signing contracts it is necessary to see that the Japanese customer affixes his seal to the contract. Foreigners are not required to have a seal; their signature is sufficient. It is sometimes advisable to get a certificate of seal, which the user of the seal by paying a small fee can obtain from the local municipal office.

Japanese Arbitration Law

The Japanese have a very good arbitration law and from what I have been told about the New York arbitration law it is practically the same, although the Japanese law has been in force for more than thirty years, whereas the New York law is comparatively recent. The Japanese arbitration law is not compulsory unless an arbitration agreement is in the contract. Arbitration outside of Japan will not be enforced in Japan, nor will foreign judgments be executed unless reciprocity is assured by treaty. There is no such treaty between Japan and the United States.

Other Legal Procedures

Oral agreements are legally as good as written agreements, as the Japanese have no statute of frauds, but under the system of legal procedure in Japan it would be very hard to prove an oral agreement.

Conditional sales or chattel mortgages are not effective nor are there mechanics liens.

Although specific property may be recovered, the effective replevying of an article as used in America is not developed in Japan.

ITALIAN FLOATING FAIR TO LATIN AMERICA

IN connection with the recent tendency toward closer relations between Italy, Spain and Latin America, it is interesting to note that Italy has prepared a floating fair to call at Latin American ports. The steamship Italia, containing the exhibits, sailed from Spezia, Italy, on February 27, for a 210 days' cruise, in which it is to travel 23,000 miles, making a complete circumnavigation of South America and visiting all the important ports, with lengths of stay ranging from ten days at Buenos Aires to one day at Punta Arenas, Chile, and Colon, Panama.

The cost of equipping the ship with the exhibits is said to be about 5,000,000 lire. The decorations are very elaborate, displaying the best Italy can supply in the way of wood carving, painting, stained glass, hangings, mosaic pavements, and marble staircases. The exhibits cover the whole range of Italian production from large automobiles to dainty handicraft. Each exhibit has a representative to display the wares and take orders. The expense of the voyage is to be divided among the participants, being estimated at about 15,000 lire per unit of space (base 1 meter, height 1.8 meters), and the passage for the entire cruise at 25,000 lire per person.

In addition to the commercial aspect of the cruise, it is aimed to create a better understanding of present conditions in Italy and to attract foreign tourists and the investment of foreign capital in Italy.—(Commerce Reports.)

CENTRAL CHINA LUMBER MARKET

THE demand for lumber in Central and North China is supplied largely through Shanghai. There the lumber trade is adversely affected by lack of purchases by the railways and other government institutions in North China, which are, under normal conditions, the largest individual consumers of American woods. While imports show a considerable reduction under 1922, business during the entire year was in a far better condition than during that year. Overstocks were worked off and normal stocks left on hand at the end of the year Prices fluctuated very little, and the market was firm and steady throughout.

Imports of American woods into Shanghai during 1923 totaled 74,300,000 feet, according to the Chinese Maritime Customs Those from other countries were as follows: Philippine Islands, 3,500,000 feet; Japan, 4,100,000 feet; Singapore, 1,100,000 feet; and Siberia, 1,700,000 feet.

In comparing the 1923 imports from the United States with the 1922, which totaled 122,000,000 feet, two facts must be remembered—first, that shipments would probably have been much larger thad it not been for the earthquake disaster in Japan, which caused many cargoes to be diverted to that country and made space very difficult to obtain; and, second, the 1922 imports of 142,000,000 feet were considerably in excess of consumption and left a stock at the beginning of 1923 of about 60,000,000 feet as compared with the normal of approximately 25,000,000 feet. This large stock at the beginning of 1923 added to the year's imports of 74,000,000 feet made a total of 134,000,000 feet available. Stocks at the beginning of 1924 were 25,000,000 feet, which would indicate that there were approximately 109,000,000 feet consumed during 1923.

Pacific Marine Review

PACIFIC-ASIATIC TRADE OUTLOOK

(Continued from April Trade Section)

Dutch East Indies

The year showed considerable decrease in imports due to collection by the government of retroactive taxes and an unfavorable exchange rate.

Outside of a few large American manufacturers, handling highly specialized lines and taking an intelligent and active part in the trade of the colony, American business men have not shown the interest in this important purchasing unit which the opportunities should justify. The import trade runs into very large figures and competition is keen and intelligent, but the volume of business offered is such as would warrant considerable initial effort in becoming established.

Siam

Lack of direct shipping facilities and of local representation is causing a decided falling off in Siamese-American trade. Exports from the United States to Siam dropped from $871,000 in 1922 to $798,000 in 1923, and imports from Siam totaled only $222,000 in 1923 and $141,000 in 1922.

Philippines

Trade of the islands with the United States showed considerable advancement over 1922. Our imports of Philippine products amounted to $77,645,840, against $61,743,430 the previous year, while exports to the Philippines from this country came to a value of $49,240,730, compared with $43,298,140 in 1922.

The islands' progress in trade alone in 1923 was sufficient to render the outlook at the close of the year far more encouraging than 12 months previous.

French Indo-China

The trade of French Indo-China with the United States suffers from lack of direct shipping lines and the high tariff imposed on American goods which are transshipped to the colony. During the year a combined effort was made by the chambers of commerce of Indo-Chino to exempt American products from this ruling, which is an indication of the popularity of American manufacturs in this country.

The colony imported merchandise from the United States in 1923 valued at $2,041,050, a gratifying increase over $827,680 the previous year, and its exports to the United States amounted to $365,920, compared with $460,230 in 1922.

NOTES

Chinese Wood Oil Trade

The United States, during 1923, purchased 7,593,183 pounds of South China wood oil through Hongkong. This is the record and represents almost 60 per cent of the total 1923 Hongkong exports. This boom in South China oil is due to the poor crop of nuts and the unsettled conditions in Central China. Wood oil from Hankow is usually much preferred by importers, but last year was obtainable only with great difficulty.

The price on wood oil varied at Hongkong from 11 cents per pound in January to 21 cents per pound in May, the market in December dropping to 19 cents.

Hongkong Duck Market Expanding

Hongkong is rapidly coming to the front rank among the leading shipping ports of the world and, in consequence, there is a splendid market for canvas, with excellent prospects for increased sales in the future. Large quantities of canvas and gray ducks are consumed annually in Hongkong as well as in the neighboring territories which are commercially dependent on this port. These fabrics are used as awnings, hatch covers, sails, and for other general purposes by the numerous junks, motor boats, launches, and coasting steamers. The native junks generally use a closely woven matting for sails, but the employment of canvas for this purpose is gradually increasing, according to Consul William J McCafferty, Hongkong. Further information regarding the Hongkong duck market may be obtained by applying to the Textile Division of the Bureau of Foreign and Domestic Commerce, Washington, D. C. Refer to file No. 126594.

(Editor's Note.—The above item concerning Hongkonf duck market should be investigated very carefully before action is taken. We are creditably informed that the duck used for sails on Chinese junks is largely Japanese flax duck, which does not mildew and rot when rolled wet. Also all standard duck in the Orient is 24 inches wide.)

Fruits and Nuts to Britain

Pacific Coast growers and shippers will be interested in the following statement of British fresh fruit trade in 1923:

Apple imports in 1923 showed a very extensive increase. A total of 6,473,457 hundredweight was received, or over 2,000,000 hundredweight more than in 1922, which year recorded a rise of nearly half a million hundredweight over 1921. The poor English crop in 1923 no doubt played a part in effecting this striking increase, while the introduction of an extensive fruit advertising campaign—not only of apples but of other fruits—in British newspapers has probably encouraged greater consumption. Imports of apricots and peaches were almost 50 per cent greater in 1923 than in the previous year. Remarkable figures were recorded for imports of plums in 1923, when 839,078 hundredweight arrived—practically five times the quantity received in the two earlier years.

The details of the trade in 1921-22-23 can be seen at a glance from the table herewith.

British imports of fresh fruits and nuts, 1921–1923

Kinds	1921	1922	1923
Apples ..... hundredweight	4,001,153	4,471,873	6,473,457
Apricots and peaches ..... do	71,471	70,240	103,794
Bananas ..... bunches	9,540,270	11,063,[illegible]	11,[illegible]
Cherries ..... hundredweight	111,566	[illegible]	[illegible]
Currants ..... do	74,851	96,470	110,[illegible]
Gooseberries ..... do	34,084	4,056	[illegible]
Grapes ..... do	593,477	651,992	758,028
Lemons, limes, and other citrus fruit, not otherwise specified ..... hundredweight	867,542	869,824	[illegible]
Nuts used as fruit:			
Almonds ..... do	203,945	214,891	[illegible]
Other ..... do	1,016,103	1,140,034	1,[illegible]
Oranges ..... do	5,877,610	6,052,583	7,[illegible]
Pears ..... do	748,992	697,[illegible]	[illegible]
Plums ..... do	167,557	165,[illegible]	[illegible]
Strawberries ..... do	73,181	78,011	81,[illegible]
Other ..... do	500,079	[illegible]	[illegible]

[1] Used to distinguish from oil nuts (such as peanuts, coconuts, etc., which are classed as oilseeds.

Table showing the fruit and nut trade of Great Britain for the years 1921-22-23

PROGRAM OF MARINE SIMPLIFICATION

IN an effort to increase the efficiency and reduce costs of construction, fitting, and operation of American shipping, the American Marine Standards Committee has adopted an expanded program calling for surveys covering a vast number of items, and will refer these to special technical and sub-committees for study and recommendations for standardization and elimination, it was announced recently by the Division of Simplified Practice, Department of Commerce.

The enlarged program is divided into three groups, one dealing with hull details, another with engineering details, and the third with ship operation details and supplies, and the American marine Standards Committee, which has undertaken this division of work, includes E. H. Rigg, chairman; William Francis Gibbs, Captain C. A. McAllister, Captain John F. Milliken, Rear Admiral J. D. Beuret, U. S. N., Rear Admiral J. K. Robison, U. S. N., and Brigadier General H. Taylor.

The subjects selected for standardization include the following:

Hull Details

Insulation—structural—typical designs and specifications to comprise insulation of cold storage and refrigerator spaces; insulation of bulkheads and decks; heated spaces; also sound-proof insulation.

Hardware—joiner—Outlines and specifications of essential types—

(a) of ordinary finish and quality for cargo vessels, etc.

(b) of high finish and quality for passenger vessels, etc.

Skylight lifting gear — Mechanical, for heavy skylights. (Light gear for small skylights to be considered as hardware.)

Plumbing fixtures — Typical designs and specifications to define standards of quality, fix outlines and over-all dimensions of fixtures and the positions, sizes and types of connections.

Floor drains (including refrigerators)—Deck scuppers, scupper and w. o. flap valves; also bleeder plugs; standard drawings.

Cargo and oil-tight hatch fittings—Standard drawings.

Rail and awning stanchions—Standard drawings.

Manholes and scuttles—Standard drawings.

Non-watertight and watertight hinged doors and fittings—Standard drawings.

Eyebolts, pad eyes, ring bolts, lashing triangles, and turn buckles—Standard drawings.

Cargo booms (wood and steel) and fittings—Standard drawings.

Fixed ladders (metal and wood), Jacob's ladders—Standard drawings.

Metal berths, including spring mattresses—Typical standards of designs and specifications.

Fire buckets and racks, and hose racks—Standard drawings.

Engineering Details

Manifolds (suction and discharge)—Typical standards.

Piping—Specifications for various kinds of pipe used on ships.

Pipe flanges—Existing standards to be studied with a view to the adoption of single standards for various zones of pressures, services and materials.

Propeller hubs—Typical standard designs. (This is to be regarded as supplementary to the design of tail shafts assigned to a subject committee formed to consider shafting.)

Line shaft and shaft strut bearings—To be assigned as above item.

Lubrication—Design of lubricating systems and appliances. (The committee to be formed for this subject is to act in conjunction with the subject committee for standard instructions on lubrication and lubricants, and the scope of its work is undetermined.)

Gages (pressure and vacuum), thermometers — To standardize outlines, sizes and types essential for marine use.

Rules for boilers and pressure tanks—(A committee to be formed to handle this subject is to endeavor to bring about the unification of requirements between the Steamboat Inspection Service and classification societies in an effort to produce single standards.)

Hose plugs for deck and machinery spaces—Typical standards to be developed in connection with "hose and couplings" under the group "Ship Operation Details and Supplies."

Fire brick and refractory cement—To standardize sizes, general characteristics of the materials and method of application.

Ship Operation Details and Supplies

Care and operation of diesel machinery in general—Standard elementary instructions.

Care and maintenance of oil tanks—Standard instructions. (The instructions already issued by the American Bureau of Shipping and others will be considered by the committee formed to study this item.)

Water (fire) hose, steam hose, oil hose, and couplings—(The committee to be formed to handle this subject is to consider what has been done by other bodies, with a view to approval of their conclusions as marine standards.)

Chinaware and glassware—Study of types, sizes and specifications for possible eliminations.

Oil lamps—Study of types and specifications.

Blankets—Study of the sizes, kinds and specifications.

Linens and cottons (sheets, towels, napkins, etc.)—Recommendations for standard kinds, sizes and specifications.

Safety equipment—To list eqnipment for various types of ships and service conditions, and to make recommendation of good practice for standards.

Life preservers—To study types and specifications.

Machinery and equipment, spare parts — To study typical lists and their character and to study specifications.

Generally speaking, it was stated, the subject committees to be formed in the three divisions to take up the items listed above will confine their work to study of essential sizes and kinds, eliminating from consideration all varieties of types and sizes regarded as unessential. Such committees, as far as practicable, are to be composed of representatives of designers, manufacturers, builders and users.

The committee instructed its secretary to ascertain whether or not the subjects to be taken up are under consideration by other committees or bodies, or if the work planned is affected by that of other groups; and in the case of such other studies, every effort will be made to guard against duplication of effort.

The committee will hold a meeting some time during the latter part of April or May, it was stated.

Pacific Marine Review

THE ZEUNER VALVE DIAGRAM

Its Relation to Valve Positions and the Indicator Diagram

By HARRY SMITH,
Hooven, Owens, Rentschler Company

IN order that a more thorough knowledge of the events which take place inside the cylinder may be obtained, a careful study should be made by a graphic method of the various conditions governing the admission and exhaust of steam. There are a number of methods in use, but the one most generally employed is the Zeuner diagram, the practical use and solution of which is described below.

Let us assume for the purpose of illustration that we have an engine in which the valve travels a distance of 5 inches, and that we wish to analyze the function of this valve with relation to the events which take place inside the cylinder, coupled with the conditions illustrated on the indicator card.

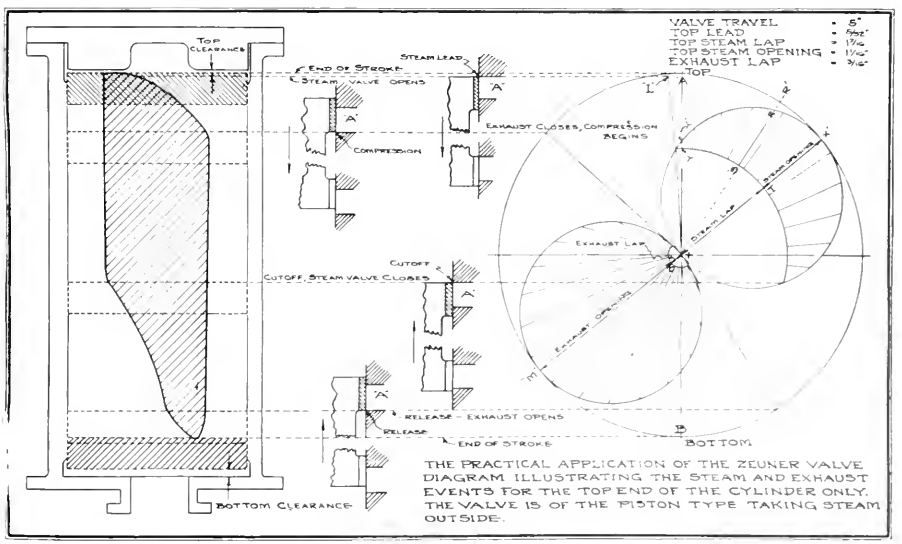
In the figure at the left in the illustration we have shown the cross section of a cylinder with an indicator card outlined therein showing what actually occurs as the steam enters and is exhausted from the cylinder. To the right, we have drawn a vertical line and have laid off two points on it, A and B, respectively, five inches apart to correspond to the total valve travel. We now bisect the line A-B and obtain the point X. Using X as a center, we describe a circle using the radius X-A. The diameter of this circle will therefore be the line A-B, which is equivalent to the total valve travel, and the circumference will represent the path actually described by the essentric in making one complete revolution.

The circle described on the diameter A-B may also be considered as representing a complete revolution of the crank on a reduced scale. The application of this circle, described by the throw of the eccentric, to the crank circle may be clearly seen by reference to the cross section of the cylinder shown on the left.

Considering the circle on the right as representing the path of the crank pin, we may assume the points A and B on the circumference of this circle as corresponding to the top and bottom centers respectively. The angle of advance may then be laid off on the crank circle from the line, through the top center X A, which in this case is the angle A XX'. Now extend the line from X' through X to the point M. Then, using the lines X M and X X' as diameters describe circles thereon. The circle having the line X X' as a diameter represents the events governing steam admission, while the circle X M represents the events relating to exhaust.

On the line X X' measure off a distance X T from X equal to the steam lap and with X as a center describe an arc, using X T as a radius. The amount of steam opening will then be represented by the distance T X'. On the line M X measure off a distance X O from the point X equal to the exhaust lap and from X as a center describe an arc with X O as a radius.

We have now prepared a diagram which shows graphically the steam and exhaust events which take place in one end of the cylinder. To illustrate the practical application of the diagram, let us suppose that the crank is in the position X R. Then the travel of the valve from its mid-position will be indicated by the distance X R and the steam opening will be



THE PRACTICAL APPLICATION OF THE ZEUNER VALVE DIAGRAM ILLUSTRATING THE STEAM AND EXHAUST EVENTS FOR THE TOP END OF THE CYLINDER ONLY. THE VALVE IS OF THE PISTON TYPE TAKING STEAM OUTSIDE.

equivalent to the distance S-R. The line X R' may, of course, be swung around to show the steam or exhaust opening for any point of travel of the valve for one end of the cylinder.

With the crank in the position designated by the line X L, it will be observed that the steam valve has just commenced to open, the piston not yet having reached the top of its stroke, but as the crank reaches the position X-A, the top center, the diagram shows us that we have a steam opening equal to the distance Y Y', which, of course, represents the steam lead.

By a careful study of the drawing, the valve position and the points on the indicator diagram corresponding to these various positions may be clearly determined and much valuable information obtained concerning the setting of the valve. The effect of a change in the steam or exhaust lap, or in the angular advance, may be readily shown by plotting the various values in the method described and noting the changes caused thereby.

It will be of particular interest to note that if the angular advance be decreased, or that if the valve travel circles be moved back in a counter clockwise direction, the steam lead will be increased, in general, making all events come earlier. Of course, moving the valve travel circles in a clockwise direction will have exactly the opposite effect, namely, decreasing the steam lead and making all events come later.

Attention is also called to the fact that the effect of any change of steam or exhaust lap can readily be seen on the valve diagram by altering the radius of the arcs representing the steam and exhaust laps. For example, if the exhaust lap is increased, the steam lead will be cut down, admission occurring later and cut-off earlier. The steam opening will be decreased in this case.

ELECTRIC DRIVE AROUND THE WORLD

TWICE around the world and twice to Japan and back, a total distance of 150,000 miles, without the slightest mishap to its electrical propulsion equipment, despite the fact that on its last voyage the ship was at the mercy of a typhoon for six hours, is the proud record of the steamship Archer, cargo carrier of the Barber Line.

The only expense to the equipment since the turbine electric drive was installed by the General Electric Company in the fall of 1921 has been the renewal of brushes on one of the generators, a cost of but $4.

"Naturally I can't say too much for the electric drive," declared Captain Berger E. Hansen, who during his 20 years' sea life has had experience with all types of propulsion machinery. "That typhoon experience, when we rode waves as high as 60 and 70 feet and were at the mercy of a 150-mile gale, I think gave a test which few electric or other kinds of cargo ships have withstood. The big feature in this storm was the non-racing of the propeller. No matter whether the propeller was in the water or out, the revolutions were the same and the engineer was not put to any unnecessary trouble.

"We were four days out of Yokohama when the Japanese earthquake occurred. That was when we hit the typhoon. We received warning by radio and changed our course, but so did the typhoon and we were right in front of it. From 10 to 11 o'clock at night, the wind blew so hard that it carried a sheet of water over the deck so thick I could not see ten feet from the pilot house. Our whistle cord pulls hard but the wind caused such a strain on this as to blow the whistle continuously for two hours.

"At eleven o'clock the wind died down a bit but the sea was exceptionally heavy until four o'clock in the morning. It was not until then that I tried to pick up our course. Life boats were washed overboard, water poured through the skylight in the engine room over the motors and generators and got into the conduits carrying the lighting wires, putting the vessel in darkness, but in spite of all this, the electric propulsion worked perfectly. Had the electric drive failed us in such a time I hesitate to say what might have happened."

On the return trip another accident happened which brought forth words of praise for the electric drive. Soon after leaving Hamburg, three of the four propeller blades were lost in one night due to ice in the ocean, but the Archer continued its trip to the Azores, a distance of 768 miles, at an average speed of 8.6 knots, with but the one blade.

"The electric drive without question saved us again. Without it the propeller would surely have raced at times so that the other blade would have been lost and then we would have had to be picked up and towed to some port," said Captain Hansen. "The first two days after we lost the three blades, the sea was heavy and the propeller was out of the water about as much as it was in. But with the motor set for so many revolutions of the propeller a minute, regardless of the water resistance, we progressed smoothly and were able to make as high as 199 miles per 24-hour day. This is very good when compared to the Archer's average distance of 260 miles a day."

Chief Engineer Thrond Thompson is just as enthusiastic for the electric drive and in addition to substantiating the words of Captain Hansen, believes this means of propulsion is more economical than others.

"There is absolutely no comparison between the electric and reciprocating engine drive," declares Chief Thompson. "We could never have done what we did in that storm with anything but the electric drive. This means of propulsion responds very quickly and readily, something most essential in such emergencies."

The Archer, a 15,900 tons displacement United States Shipping Board cargo carrier, has just left on its fifth trip to Japan and the Far East, but whether this will be another trip around the world will not be decided until the ship unloads and picks up a new cargo.

SOME LIGHTHOUSE HISTORY

(Continued from page 264)

tion of ships entering the harbor and was first lighted on Monday, June 11, 1764.

The old lighthouse is a national landmark and stands witness to some interesting history. In 1776 Captain John Conoon, acting under orders, destroyed the lantern in order that the British fleet might not be guided into New York Bay.

Sandy Hook Light and the old dwelling of the keeper was known during the Revolution as the Lighthouse Fort, or Refugees' Tower. The British fortified it, and from there the Tory refugees made their bloody raids. Remnants of the log fortifications are still to be seen.

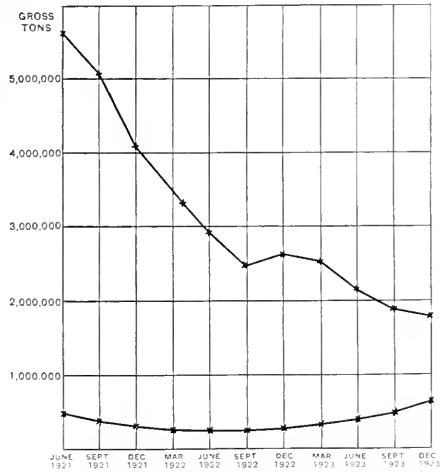
MARINE OIL ENGINE AND MOTORSHIP PROGRESS

THE MOTORSHIP PROGRAM

WE are reproducing herewith a graph showing the relative construction of the world's steam and motorship tonnage from the middle of 1921 to the beginning of 1924.

It will be seen at a glance from this illustration that, during the greatest slump in merchant shipbuilding which the world has ever experienced, the depression was hardly belt by the motorship. In fact, during the whole period of depression, motorship construction made a very decided gain on a percentage basis. At the beginning of this two and a half year period the world's motorship construction represented about nine per cent of the total; at the end it represented better than thirty per cent.

The Edmonds Bill, making possible the use of twenty-five millions of dollars as a government loan fund for the purpose of aiding in the conversion of steamers to motorships, will probably add materially to the American motorship fleet. It will not, of course,



Graph showing progress of world ship construction. Upper line total tonnage, lower line motorship tonnage.

change the relative figures in new construction. The great bulk of this new motorship construction is in British yards, which only emphasizes the need for conversion of steamers to motorships by American operators or for the construction of new motorships in America's shipyards. Certainly, if we are to get into any maritime trade with our motorships in time to figure their competition against foreign steamers, we will have to do considerable rushing of the motorship program.

Entirely apart, however, from American competition in foreign trade there is a very large opportunity for the American manufacturers of diesel engines and for American shipyards in the building and powering of coastal, intercoastal, and inland water craft, and we are gradually building up an experience and knowledge of diesel engines as used for propelling machinery of a large number of marine craft in a great variety of types applied to many varying uses and conditions.

MOTORSHIP "HANDICAP"

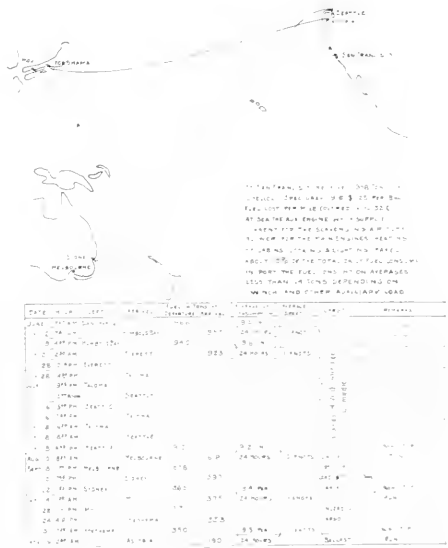
DIMENSIONS AND GENERAL PARTICULARS

LENGTH, BETWEEN PERPENDICULARS - 415' BEAM, MOULDED 54 - 0
DEPTH, MOULDED TO SHELTER DECK - 36 - 11". DEAD WEIGHT CAPACITY 9000 TONS
GROSS TONNAGE ABOUT 5200 TONS. SPEED LOADED - 11 KNOTS
LENGTH OF ENGINE ROOM APPROX 40 - 0"

MAIN ENGINES TWIN SCREW - 2700 S.H.P.
TYPE - SULZER 2 CYCLE, CONTROLLED PORT SCAVENGING
NUMBER OF CYLINDERS PER ENGINE - 4. SPEED 100 P.R.M.
CYLINDER BORE - 600 m/m (23 5/8"), STROKE 1060 m/m (41 3/4")

AUXILIARY ENGINES TWO EACH OF 330 H.P - 220 R.P.M - SULZER 2 CYCLE

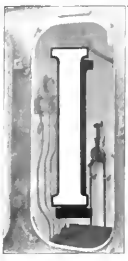
TOTAL WEIGHT OF MAIN ENGINES INCLUDING THRUST BEARINGS FLYWHEELS
TURBO BLOWERS WITH MOTORS EXHAUST SILENCERS & A.R. TANKS ABOUT 752 400#
WEIGHT OF AUX. ENGINES INCLUDING GENERATORS FLYWHEELS,
SILENCERS AND A.R. TANKS 15 6000#
TOTAL WEIGHT OF MAIN & AUX. ENGINES PER B.H.P. OF MAIN ENGINES 336.3#



Graphical chart of a motorship cruise, prepared by A. A. Tachelli of Burch-Sulzer Bros. Diesel Engine Company

NEW DIESEL-ELECTRIC TANKER

Standard Oil Company of New Jersey Adds to Its Fleet a Westinghouse-Equipped Self-Propelled Tank Barge First of Its Type on Atlantic Coast



IN February, 1924, there occurred at Chesapeake Bay a rather remarkable incident in the history of the American merchant marine. On that occasion J. H. Senior, chairman of the Marketing Committee of the Standard Oil Company of New Jersey, stepped into the pilot house of a new barge tanker, named after himself, and took over the control of this tanker into his own hands with no more preliminary instruction than would have been necessary had he been exchanging his old car for a new model. Without notice to the engine room, he spun a small wheel around until the arrow, which had been pointing full speed forward, indicated full speed astern. As he did so, R. L. Haig, manager of the Marine Department, snapped his stop watch. In exactly one minute and thirty seconds the boat had lost headway and was beginning to move backwards. Putting her at full speed ahead once more, Mr. Senior then maneuvered the electric telemotor and steered at will around the harbor, the vessel maneuvering as easily as an automobile.

The J. H. Senior was built by the Newport News Shipbuilding & Drydock Company to plans and specifications drawn up by the Standard Oil Company of New Jersey. She was intended for use in delivering bulk cargoes of gasoline and refined oils to points served by the Baltimore division, notably Washington and Richmond. She is 208 feet long with 38 feet beam and has a carrying capacity of 11,500 barrels on a draft of 13 feet.

The propelling machinery consists of two 6-cylinder 350 horsepower non-reversible McIntosh & Seymour diesel engines, each direct-connected to a 185 kilowatt 115 volt Westinghouse direct current generator. These two generators supply current to a 450 horsepower single armature Westinghouse motor direct-connected to the propeller shaft, which is turned at 100 revolutions a minute.

The placement of the machinery in the engine room will be noted from the arrangement plan herewith, the two main engines and generators being set on a diagonal line with the driving motor set between them near their forward end, and so making an ensemble that permits of the machinery being placed further aft than would otherwise be possible. The machinery is designed to drive the hull loaded at a speed of 8.5 knots an hour. The propeller is of the solid 4-blade type, 10 feet in diameter and 10 feet pitch, with a developed area of 32.4 square feet.

McIntosh & Seymour Engines

The McIntosh & Seymour engines used in the J. H. Senior are of the standard, heavy duty, slow speed type, developing 350 brake horsepower at 275 revolutions per minute. There are 6 cylinders on each engine of 13-inch bore and 17-inch stroke, working on a 4 cycle principle. For each main engine there is installed a 1½ cubic foot injection air bottle and a 10 cubic foot starting air bottle. These bottles are both charged with air at 1100 pounds per square inch pressure.

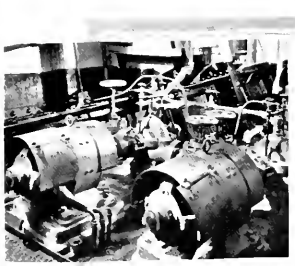
The main cargo oil pumps and all of the auxiliaries of the ship, both in the engine room and on deck, are electrically operated, the current being used for this purpose from the main generators or from the auxiliary set, which consists of a Fairbanks Morse type "CO" engine, 3 cylinder, 2 cycle, 45 horsepower at 400 revolutions per minute, direct-connected to a 30 kilowatt 125 volt Fairbanks Morse generator. This auxiliary generating set is provided with an emergency hand power air starting system. A small electric motor-driven air compressor for initially charging the air bottles is run on this auxiliary generating set.

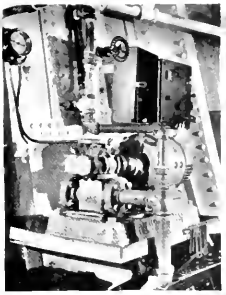
Auxiliary Machinery

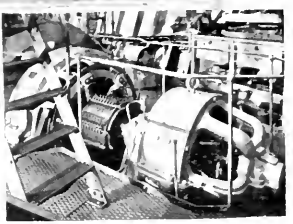
The cargo oil pumps were supplied by the Northern Pump Company to the designs of the Marine Department of the Standard Oil Company of New Jersey. They are of the rotary type, figured to deliver 375 gallons per minute against 100 pounds pressure at 300 to 426 revolutions per minute with an 8-inch diameter suction and a 6-inch discharge. The pumps are located in a watertight pump room extending clear across the hull, just forward of the engine room and insulating the engine room from the cargo tanks. The pumps are driven through gearing by 35 horsepower 115 volt 800 to 1150 revolutions per minute Westinghouse compound wound motors, the motors being located in the forward end of the engine room, and the pump shafts carried through oil-tight stuffing boxes in the engine room bulkheads.

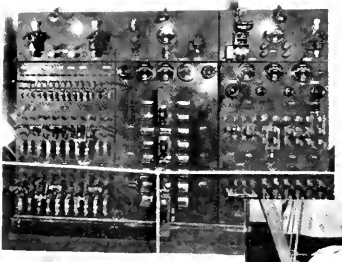
The circulating water pumps are De Laval centrifugals, 3-inch suction by 3-inch discharge, direct-connected to Westinghouse 5 horsepower compound wound motors running at 1700 revolutions a minute. The sanitary, bilge, and fuel oil transfer pumps are supplied by the Northern Pump Company and driven by Westinghouse motors. A one-half ton Brunswick refrigerator outfit is installed.

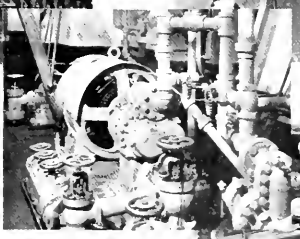
The electric galley of the new diesel-electric tanker J. H. Senior.

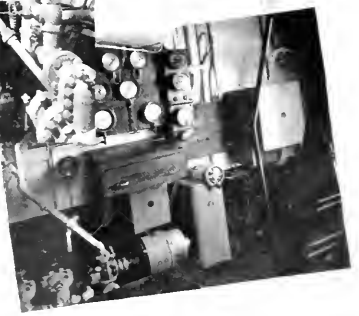












Some views of the Westinghouse-equipped diesel-electric tanker J. H. Senior—Left, [illegible]—Middle, [illegible] water ing pumps; bow view of J. H. Senior coming into the dock, switchboard, view [illegible] ats [illegible] ement [illegible] Center, upper—Sanitary pump; lower—fire and bilge pumps all Northern pump driven by Westinghouse motor. Right, [illegible] tom—One of the main Westinghouse generators and its exciter; the pilot house showing at the right the Ward Leonard system troller for the main propelling motor, and at the left the rudder control; general view of engine room looking forward between main engines and showing Westinghouse propelling motor in center with its thrust block and, at either side, the helicates and lower platform of the McIntosh & Seymour diesel engines, instruments and controller for the engine room control of the main propelling [illegible]

Electrical steering gear was supplied by the Allen Cunningham Company of Seattle. The motor gearing and drum are housed in an extension of the deckhouse aft on the main deck, the drum being connected by a chain to the quadrant on the rudder stock. The position indicator consists of a series of colored electric bulbs fitted in the control stand which show every $2\frac{1}{2}$ degrees for initial angles and every 5 degrees for wider angles of helm. It is of the non-follow-up type, the motor running continuously until the helm is hard over, so long as the control lever is on center.

Stern Tube Bearings

An interesting feature of the propulsion machinery is the stern tube bearings. Two "Cutlass" rubber bearings, supplied by the Goodrich Rubber Company, are fitted one at the forward and one at the after end of the tail shaft liner. These bearings permit of practically perfect lubrication and exclude all sand and grit, thereby tending to greatly increase the lives of the liners as well as of the bearings themselves.

Crew's Quarters

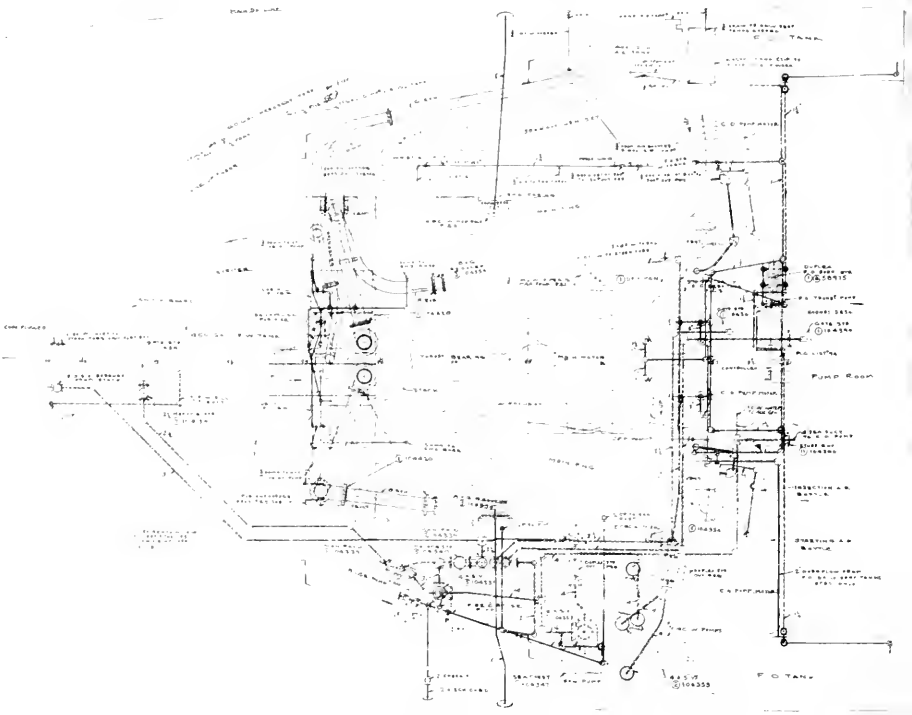
Quarters for engineers and deck crew are fitted in the deckhouse aft, surrounding the engine hatch. These quarters give very comfortable accommodations for eight men, including chief engineer, assistant engineer, three seamen, one oiler, a cook, and a boy. A commodious ice box alongside the ice machine is fitted to take care of galley stores, and the galley and messroom are conveniently laid out athwart ship at the after end of this superstructure. Quarters for the captain and the mate are fitted on the bridge deck forward.

Pilot House Control

In the main propelling machinery of the J. H. Senior the two main generators are operated in series and are direct-connected electrical through suitable switchboard control to the propelling motor.

The main engines and generators maintain a constant speed for all loads. At the after end of each generating set there is directly connected a 35 kilowatt 115 volt exciter for the field current of the generator and the motor. All variations in the propeller speed are controlled through the varying of the strength of the current in the field windings of the main generators on the Ward-Leonard system, in the same way that the majority of the street car motors of America are controlled by the motorman. Thus the maneuvering of this 220 foot 2300 ton craft is effected by a small lever in the pilot house as easily as the average American citizen manages his motorcar.

This installation is, we believe, the first of its kind to be installed in a tanker on the Atlantic Coast.



General arrangement plan for machinery and piping in the engine room of the Westinghouse-equipped, Standard Oil Company (New Jersey) diesel-electric tanker J. H. Senior.

Pacific Marine Review

THE MOTORSHIP—IS IT A GOOD RISK?

By S. BURKE SMITH

THERE was not a vacant berth, as the story was told to me, inside the Yokohama breakwater on the night of February 7, 924, and outside that coveted area ere were eighty odd ships at anor. I wish that I could weave into is story some of the personality, well as the talent, of the man ho told it to me; for he was a aster word painter as well as a aster mariner. As told by him ere was evident the tang of the lt sea spray as it breaks over ows; the inimitable sounds of high inds through rigging, ranging from e plaintive note to the defiant chalnge; the clank of taut cables be g hauled through hawse pipes and e more subdued note as the links quirm over the whelps of the wildat; the colliding of steel vessels npelled by the force of a ninetynot gale; hoarse shouts of comand and caution; and a babel of aths that seemed to punch through e derisive taunts of the hurricane. seemed that one critical situation as gotten in hand only to be sueeded by one more critical.

Of course the harbor congestion as the result of the extraordinary emands for supplies caused by the arthquake. But there was no parcular apprehension felt either forard or aft, for the season was one f expected good weather. Berths ad been assigned, allowing ample oom to swing with sufficient scope f chain.

Captain Jack Ansell was in comand of one of the vessels at anchor utside the breakwater. His was the Eastern Knight, some 7000 tons, 415 eet long, with triple expansion enines of 3000 indicated horsepower, nd three Scotch boilers. She had lmost completed discharging her argo; only some 500 tons remained n her holds. In accordance with easonal routine, steam was up in ne of her boilers for auxiliaries. ll was quiet about the bay; on eck the night watchman kept what as supposed to be a lonesome vatch; no bad weather was exected or indicated, and the proverbal goose was thought to be securely ashed to the main truck.

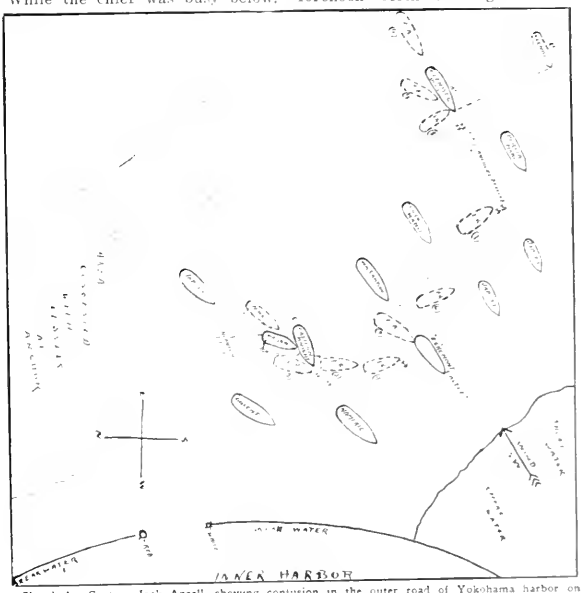
"Foul of a Norseman"

When the captain rushed on deck bout 5 a. m., awakened by some grating noise, he found that "some one had sure been raising hell durng the last watch." There was a first-class breeze out of the southwest and an angry sea was in the making; but most surprising of all was a big Norwegian steamer snuggled alongside his starboard quarter, whose cable tended underneath the Eastern Knight and was even then playing a tune athwart her keel. These important changes in the situation had not been reported by the watchman, who, escorted on the strong arm of Bacchus, had taken refuge sometime earlier in the arms of Morpheus.

An estimate of the situation showed that action was necessary, and action that would be prompt, if not prompter. So the captain decided that the best thing to do would be to heave up, get under way, surrender the berth to his Norwegian, and seek another in a place not so popular or so thickly populated. "One ship for one berth is enough," said he. So at 5:45 a. m. he directed the chief engineer to get ready to get under way as soon as possible and to report when all was ready below. This report was received shortly after 8 o'clock.

While the chief was busy below, the weather was busy on top side. The wind was steadily and rapidly increasing in violence; all vessels were yawing from right to left through the entire range that their scope afforded; the sea was getting more nasty; some vessels were veering cable to the bitter end; some were dropping extra anchors; and here and there vessels were making preparations for getting under way. But nothing could be done on the Eastern Knight until steam was raised, the anchor windlass warmed up and the engines warmed up.

Shortly after eight bells with the Norwegian veering and the Eastern Knight heaving in, the vessels drew apart. Captain Ansell picked up his anchor and started on a cruise for another berth. And cruise it was, from all accounts! Other vessels were under way, the place was congested, vessels not under way were dragging, and the problem that presented itself most often for solution was how to give or take the impact of collision with the least resulting damage to the vessels. There were more incidents crowded into this forenoon berth shifting maneuver



Sketch by Captain Jack Ansell, showing confusion in the outer road of Yokohama harbor on the night of February 7, 1924.

than are usually met in an entire voyage. At the end of an hour's battle with the elements, the Eastern Knight found herself close aboard and under the port quarter of the English liner Glenbeg, her two anchors apparently going to hold in a spot out on the starboard bow of the Glenbeg.

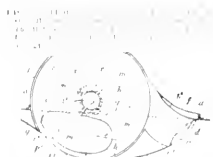
Recognizing her captain on the poop, Captain Ansell (without the megaphone) hailed him and apologized for thus intruding on the privacy of a friend's berth. The hail that was received in return assured him that "everything is all right; just one of those things that sometimes will happen; quite a ripple, eh what? and if you think your anchors will hold now, we will get out of here in a jiffy and you can have the bally berth."

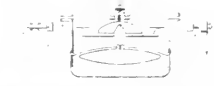
"Well," said Captain Ansell to me, "that was a mighty fine, generous speech to make, and I accepted his offer with thanks, as you may believe. But I could not help wondering how long his 'jiffy' was going to amount to. As far as I could see, he did not have any steam up and I had already begun to work out in my mind what my next move would be, when I looked over and saw the captain going up his bridge ladder. Well, sir, almost as soon as he reached the bridge that big brute of a boat was under way. No fuss or confusion and she handled like a yacht. Then it dawned on me. She was a motorship and she got under way in less than ten minutes, where it had taken me two hours."

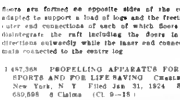
"Great Scott," he continued, "if I could have gotten under way at ten minutes past 5 that morning, things would have been different. But in good weather a captain is not justified in spending his owners' money keeping engines warm, steam up, and a full watch below—it runs into too much money. But think of the peace of mind that the captain of the Glenbeg must have, secure in the knowledge that, without spending a cent, he is able to get under way at a moment's notice. Yes, sir, when there are more diesels there will be fewer claims, and," scratching his head, "fewer gray hairs in the captains' heads."

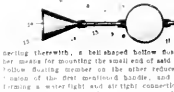
(Continued on page 295)

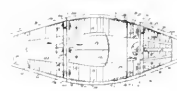
THE MONTH'S MARINE PATENTS











REMINISCENCES OF THE DAYS OF STEAM

ON THE BAR AT TOPOLOBAMPO

By W. P. LINDLEY

SOME ten years ago the Mexican steamer Ramon Corral, owned by the Compania Navigacion del Pacifico, changed her registry to provisional American, and her name to Colon. This was made necessary, as Mexico was at that time being torn by Villiastas and Carranzistas, and between them private companies were getting hit pretty hard. Putting the boat under the United States flag gave her protection; it also necessitated that the officers be American citizens. Captain Paulsen was appointed to command and W. P. Lindley was made chief engineer.

The boat had been brought to San Francisco by her Mexican crew, and these had to be taken back to their own country after the transfer of flags. After being fixed up a bit, the steamer left San Francisco with a fair load of freight and picked up more, with several passengers, at San Diego. She then headed for Lower California ports and made Ensenada, La Paz, Mazatlan, Guaymas, etc., doing well, until she came to the port of Topolobampo. Here bad luck, or intention of the pilot, caused her to strike on the bar, and a falling tide left her hard and fast. That night a strong wind and sea knocked her about pretty badly. Wireless messages were sent out and responded to by the U. S. S. Maryland and Annapolis. These vessels stood by all night, and next day took off the passengers and crew.

Rigging Pumps

Efforts had been made to get the steamer afloat, but she was leaking freely, and the pumps became choked with sand. The engine and fire rooms were flooded and there were no tugs near to aid her. The commander of the U. S. S. Maryland took all hands aboard his vessel except Captain Paulsen, the chief engineer, the mate, and the purser. The Maryland then left for Mazatlan. Those left went aboard the British steamer Citriana. It was then still blowing strong, and seas were breaking over the Colon.

Next morning it was calm and smooth, and Captain Paulsen and the rest of us went out aboard her. We found her with about ten feet of water in the holds, fore and aft, but resting easily. Captain Paulsen went ashore and got a vertical boiler and a 6 by 4 by 6 inch duplex pump and some odds and ends of pipe. This was brought alongside, and we got busy rigging up to try and pump out the water. There was no one there that had any idea whatever of firing a donkey boiler, or of working an injector except the chief. He took long hours and the weather keeping fine, we got her dry enough to float the next high tide, which was about five days after.

The wireless operator had in the meantime set up his plant on the Citriana and was in touch with San Francisco. Owing to the revolution at that time on in Mexico, no telegrams could be gotten through. Everything was at sixes and sevens, with little or no law or order.

Clearing Engine Room

After getting the Colon alongside the wharf at Topolobampo, we kept pumping until we had the water down so as to get fires on the main boiler (the donkey being useless), and then had steam enough to work the winches. The cargo was also discharged, lightening up the hull materially and decreasing the inflow of water, though it took steady pumping to keep her clear. Things in the engine room were in a wreck, but with a few peons to help clean up and a couple of Mexican sugar mill machinists, we commenced to untangle things. Several of her steam pipes were broken due to straining while on the bar, but these were nominal and soon fixed. The sand in the bilges was the worst feature of the cleaning, as well as the filth from the holds, where raw-hides and bones had formed a large part of the cargo. The bulkheads were not tight and everything flowed through to the engine room bilge. Fortunately we got hold of a couple of Mexican firemen who had been in Pacific Mail steamers, and started watches in the fire room.

Not liking oil lamps, I one day thought I would start up the dynamo and see if it would run. Had hosed everything down well with fresh water when we got to the wharf and oiled and cleaned things a bit. I started the dynamo, not expecting much success, as it had been under water for nearly a week, but to my surprise and pleasure she picked up and the lights burned well. Sparks then took his set back on board, and we were beginning to get a bit shipshape. The deck folks had got the holds cleaned, and we wanted to get started back for San Francisco for repairs. All the crew, however, except those first mentioned, had been taken to Mazatlan, and we vainly tried to get in touch with them through the American consul so they would be sent back to us. It was quite a number of days before communication was established. Meantime we found that most of the sea water was coming in at the after peak bulkhead; so we patched this up with timbers and canvas and drove a wooden plug in where a broken bulkhead valve had been. This lessened the leak materially, and a couple of pumpings a day kept her clear. Then we turned attention to the engines and put steam on them. They worked, but there was a decided twist at the tail shaft and stern gland. We had no diving suit, but the water was warm and clear, and a good swimmer dove down to see what was up. He found the rudder all right, but the stern frame broken just below the boss and the lower part about six inches over to starboard.

Back to San Francisco

The Chief told Captain Paulsen that it was worth trying to make San Francisco, so we got ready to leave as soon as our crew showed up. Meantime several people wanted to go as passengers and quite a bunch of freight was offered. The U. S. S. Annapolis came in, a temporary survey was made, and the naval men gave us permission to take passengers and some freight. Two days later our crew showed up and were signed on by the captain of the Annapolis. They had all been paid off when taken on the Maryland and were to have been sent back, as it was believed at that time the Colon would not get off.

(Section continued on Adv. page 33)

THE NEW LINER COLUMBUS

World's Sixth Largest Vessel Being Put on the New York-Bremen Run by North German Lloyd

WITH the arrival in New York harbor on April 30 of the new North German Lloyd liner Columbus, travelers and others will have the opportunity of viewing the largest steamship of the German merchant marine.

The Columbus, with length over all of 774 feet 3 inches, equal to three average city blocks, a breadth of 83 feet, of 32,000 gross register tons, is the largest steamer ever placed in the service of the North German Lloyd, and the sixth largest vessel in the world's merchant marine.

The net carrying capacity of the Columbus is 10,000 tons, of which about 6000 is required for fuel oil, the ship being an oil burner, 2000 tons for fresh water, and the remainder for cargo, baggage and provisions. Her engines, generating 28,000 horsepower, drive her through the water at a speed of 20 nautical miles an hour, operating twin propellers, each measuring 23 feet across. The North German Lloyd will maintain with the new steamer a schedule of seven days to France and England and eight to Bremen, Germany.

The Columbus is the second new liner of that name to be built by the North German Lloyd and she is a sister to the first Columbus, which vessel was turned over as part of Germany's reparation and is now the White Star liner Homeric. Like the Homeric she is engined with two sets of 4-cylinder triple expansion reciprocating engines, having 47.24 by 82.68 by 295.45-inch diameter cylinders with a 70.86 stroke. These are the most powerful reciprocating jobs afloat.

Steam for these engines is provided by 12 double-ended Scotch marine boilers, with a total heating surface of 73,469 square feet, and a working pressure of 206 pounds per square inch. This boiler plant is arranged for burning oil fuel and special provision has been made for quick bunkering, allowing the ship to take on 6000 tons in 18 hours.

For auxiliary machinery and lighting there are five 140-kilowat, 115-volt generating sets and one 90-kilowatt set. This vessel has nearly a thousand horsepower in electric motors. The ventilation system requires 491 horsepower, the elevators and deck machinery 338 horsepower, dishwashing and laundry 31 horsepower, and pumps over 90 horsepower. There are nearly three hundred electric heaters in connection with passenger accommodations and a great variety of electrical appliances are used in the dining rooms and galleys throughout the ship.

Accommodations are provided on the vessel for 400 first-class passengers, 600 second-class, and 800 third-class in addition to a crew of 733 officers and men, or a total of 2533 persons. On the spacious boat decks, which are 19 feet wide on each side of the ship, there is life boat equipment for every passenger and member of the crew.

There are nine decks on the new liner, which are reached either by several grand staircases or spacious elevators which are always in service. The interior of the ship is so divided by watertight bulkheads that she is practically unsinkable. Even in the event of her outer "skin" being pierced by collision or otherwise, these bulkheads would permit water to enter only a small number of compartments.

One of the features of the Columbus will be the automobile room in the bow, where automobiles belonging to travelers will be transported. The cars will be placed aboard through a large hatchway and upon being taken out at their destination will be in readiness for use, except for the filling with gasoline. Large baggage rooms connected with the decks by elevator have been installed, permitting passengers easy access to stored baggage during the voyage.

The cabins and public rooms aboard the Columbus are furnished with a display of artistic taste which has always distinguished the larger passenger liners of the North German Lloyd, the first-class dining room occupying a space of 9675 square feet and surmounted with a domed glass skylight, being one of the handsomest rooms on any ship in the world. Elevators and a spacious main staircase run direct to this room, adjoining which is the first-class children's playroom and several spacious private cabins with bath.

Throughout the vessel everything for the comfort and convenience of the trans-Atlantic traveler has been installed. The upper promenade deck is spacious and easily reached from all parts of the ship, and is equipped with glass partitioned storm windows. Amidship of this deck and extending upward and through to the boat deck, are various social centers, such as the smoking room with its adjoining well stocked bar and the verandah cafe, not to forget the library and the magnificent social hall which are connected by large passageways along both sides of the vessel.

The second-class public rooms, while not so elaborate as those of the first-class, are characterized by elegance and solid comfort, the two second-class dining rooms occupying 6225 square feet of space. The social hall and the ladies' room are beautifully furnished and easy of access.

Third-class accommodations on the Columbus are far superior to those of first-class on steamers of not many years ago, all third-class passengers being accommodated in cabins and having for their use one large public room furnished tastily with a view to comfort as well as appearance.

The cuisine in all three classes is well known to all trans-Atlantic travelers and in the Columbus large use has been made of electric heating and cooking appliances. Ten large electric ovens are found in the galley and bakers' departments, not to mention electric toasters and other small accessories.

The lighting system of the Columbus supplies power to 4200 incandescent lights and in addition there are 1400 connections for floor lamps, table lamps, curling irons, fans, etc. An extensive call bell and telephone system ranges through the ship, connecting individual and public rooms with a main station where bellboys are ever at the service of the traveler.

A new and distinctive feature of the Columbus' life-saving equipment is two motor-driven life boats equipped with high-powered wireless. These boats each will accommodate forty persons and could in an emergency tow a line of other life crafts. Their radio apparatus is capable of sending signals on a wave length of upward of 600 meters.

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

INTERESTING CENTRIFUGAL INSTALLATIONS

LUBRICATION is one of the major problems in marine geared turbine installations. High tooth pressures, continuous duty, and mobility of foundation all combine to make more difficult the function of the lubricating medium. It is therefore highly important that this medium be kept in first-class condition and be cleansed of all moisture and impurities.

As a general rule, water is present in the oil only when a cooling coil lets go. It is then present in large quantities. There is another sort of water contamination, namely, leaks into the main bearing housing. Water from this source is slight in amount.

The sludge formed from the breakdown and oxidation of oil at high temperature deposits throughout the system. If it is not removed sufficiently often, it accumulates to such an extent that it interferes with the flow of oil. Insufficient lubrication at important points will result, with the subsequent danger of serious damage to the turbines. Sludge depositing in the oil cooler reduces its effectiveness, causes an increased temperature in the oil and results in more rapid breakdown of the oil. When water is present in the oil the formation of sludge is accelerated and stubborn emulsions are formed.

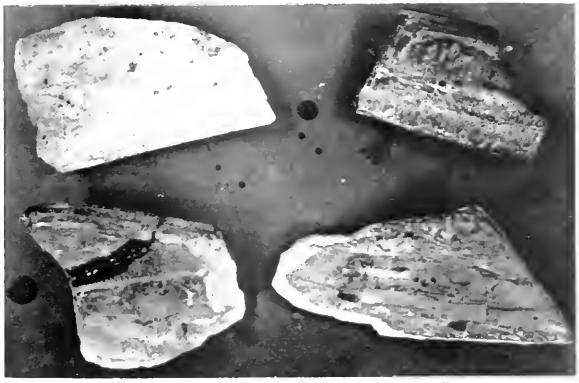
Turbine oils when new, or in use for a short period of time, will generally show a high degree of demulsibility. The demulsibility factor decreases as the oil continues in service.

Particles of dirt, dust and metal that are present in the oil accelerate the formation of sludge in the presence of moisture and cause a loss in lubricating efficiency. Even oil that has been in service for a long time has in itself satisfactory lubricating properties. Any decrease in its lubricating value is caused by the presence of impurities introduced during service.

Our illustration shows the installation of a Sharples super centrifuge on board the steamer Maui of the Matson Navigation Company. This machine is connected in a by-pass line of the main lubricating system and on continuous operation thoroughly removes all dirt, sludge, grit and moisture from the lubricating oil. The Sharples super centrifuge fits into the lubricating oil system as an accessory unit and is so piped up that the circulation of the lubricating oil will be continuous, in case the super centrifuge is shut down for any reason.

The Sharples super centrifuge as installed for cleaning the lubricating oil on the Matson liner Maui.

Pacific Coast motorship operators will be interested in an installation of two Sharples centrifuge machines on board the new motorship Pacific Shipper of the Furness Line, now on her way to San Francisco. One centrifuge takes care of the lubricating oil, the other is used to clean the fuel oil. It is claimed that this latter use will show the possibility of burning cheap low grade fuel in diesel engines with a decided gain in economy. This is an experimental installation and a very careful check is being kept by the engineers for the ship's owners, for the ship's builders, and for the Sharples Specialty Company.


Samples of sludge taken from the bowl of the Sharples centrifuge

A NEW WOOD PRESERVATIVE

WOODEN vessels employed in southern waters are exposed to considerable danger of destruction by the teredo worm and other marine borers. In order to prevent such destruction, many vessels are sheathed with copper or yellow metal plates, which also serve to keep the bottoms clean; others are painted with the usual copper paint, which is manufactured by many firms in this country. In certain waters this has to be gre quently renewed, and even then if the vessel gets chafed, the teredo worm may penetrate into the planking, and once having got in may spread through the structure.

We understand the International Compositions Company, Inc., of 90 West street, New York, are now bringing out a new preservative solution, protected by patent rights, with which they propose to impregnate the wooden planking, etc., used for the construction of wooden vessels.

This preservative contains a substantial percentage of mercury in solution, and it is believed that this will be an absolutely permanent preservative of wooden planking which has been properly impregnated with it. The form in which the mercury is introduced is as an oleate. The oleate of mercury is dissolved in certain spirits.

The process of impregnating the wood may be as follows: Warm the wood up to 250 degrees Fahrenheit in a kiln or other suitable receptacles for one, two or three hours, according to its thickness. During this process of warming, most of the moisture of the wood is evaporated and the heat causes an expansion of the gases and air within the structure of the wood. The period of warming depends upon the thickness of the planking; for a thickness of one inch, an hour would be sufficient; for two or three inches, a period of two or three hours may be recommended. Care should be taken that the temperature of the receptacle within which the wood is being warmed shall not exceed 280 degrees, as otherwise the wood may begin to char. The best temperature is about 240 or 250 degrees. After the wood has been so warmed, it is removed from the warming receptacle and placed into the cold oleate solution. The result is that the cold temperature of the solution causes the air and gases in the wood to contract and to quickly absorb the solution. A period of one, two or three hours, according to thickness of the wood, is required to bring about a complete absorption.

It is well known that the teredo worm belongs to the class of crustacea or cirripedia, and these are much more subject to the action of mercury than any of the other toxic substances.

Oleate of copper might be added to the solution, but owing to the action of copper on iron this is not always desirable. The oleate of mercury, however, has no destructive action on iron, and iron or steel fastenings can be used with perfect safety in connection with mercurized wood. It has been found that this solution will penetrate completely throughout blocks of wood three inches thick, if treated in the manner indicated.

Hitherto, creosote has been considered the best preservative for wood against marine borers, but creosoted wood does not recommend itself for shipbuilding purposes on account of the smell and the greasy black surface. There is no drawback of this nature in connection with mercurized wood, which will retain its color and can be painted or varnished. This mercurizing solution also has the effect of waterproofing and thus preserving the wood against getting waterlogged.

It is to be hoped that this method, which is based on A. C. Holzapfel's long experience in the manufacture of anti-fouling paints, will be quickly put to thorough tests, so that shipbuilders and shipowners employing wooden vessels may be benefited thereby. It goes without saying that this solution would be very valuable for preserving wooden piling. In fact we are informed that wood blocks impregnated with a modified form of it have been exposed for about a year at various stations of our southern coasts and are so far showing complete immunity against marine borers.

Westinghouse Equipping S. S. Sierra

THE Oceanic Steamship Company's steamship Sierra, now undergoing alterations and reconditioning at the Bethlehem Shipbuilding Corporation plant, San Francisco, is to be fitted out with a number of the latest electric appliances.

There will be installed 125 marine type fans, which will be of the new Westinghouse design with totally enclosed motors, marine windings, brass guard and fittings and demountable base. The fans will have a black satin finish throughout, except those to be installed in the social halls and staterooms de luxe which will be finished in ivory to better harmonize with the luxurious mahogany and gilt furnishings.

A splendid ventilating system is being installed requiring eight large blowers of American Blower Company manufacture driven by Westinghouse motors.

The galley is to be equipped with an automatic three-deck Westinghouse electric bake oven of 60 loaves' capacity. The sections are entirely independent so that bread can be baked in one or two sections and pastry in the other. This oven operates at any desired temperature without supervision. The electric heat cuts shrinkage of food to a minimum, turning out a very high grade product. Two Westinghouse electric hot tables are also being supplied.

To take care of the additional electric load, a 50-kilowatt Westinghouse type EHNC turbine generator set is being installed in the engine room.

SURPLUS SHIPYARD MATERIALS

WE have recently received from the surplus department of the Moore Dry Dock Company a list of surplus shipyard materials, which are on sale at their plant at the foot of Adeline street, Oakland, California.

This list covers 42 pages of typewritten material segregated and indexed so as to make a very complete catalog covering materials which range from $\frac{1}{4}$-inch machine bolts to 100-horsepower motors. The majority of this material is new and is of first-class quality, comprising bolts, nuts, boiler tubes, pipe fittings, pipe, nails, rivets, valves, and gauges.

Here is an opportunity for any one having use for such materials or machines to purchase at bargain prices.

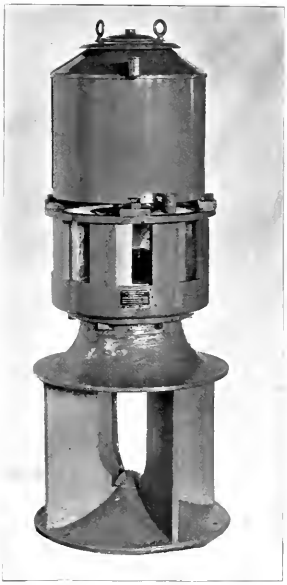
BASED ON SOUND PRINCIPLES

The Heath Engineering Laboratories, Inc., of San Francisco, Develop an Effective Line of Scientific Instruments for the Production and Projection of Audible Warning Signals

THE perils of coastwise navigation led to early adoption of various types of warning signals placed at dangerous rocks, headlands, and shoals to direct sea craft into more open water. Bells, tolled by the motion of the waves, or whistling buoys, worked by the same means, have been in this use for centuries. The use of sound signals was, of course, particularly valuable in locations subject to frequent fogs.

Till very recent years there were only two rules governing the design and installation of apparatus for producing sound signals. First, it should make as loud a noise as possible; second, it should be placed as near the surface of the water as possible.

Many experiments have been made by the United States Bureau of Lighthouses with steam and compressed air fog horns and sirens. The various physical laboratories of America and Europe have carried on research until at the present time we have a fairly definite knowledge of the theoretic phenomena of sound vibration and of the permeability of the atmosphere to the passage of such vibration. Working under practical conditions, however, we find that the laboratory results are very seldom duplicated. Atmosphere is always of an uncertain quality and quantity and particularly so if charged with moisture. Often foggy atmosphere will be full of vastly varying conditions in closely adjacent areas. There will be very dense spots and spots of low density. Wherever sound vibration passes into or out of these spots it is greatly retarded. At the same spot on different days there may be a tremendous difference in the penetration of sound waves from a given source.



Heavy marine type

The Heath Engineering Laboratories of San Francisco have been experimenting for some time on the development of an ideal self-contained sound signal producing unit that would be susceptible of adjustment and type so as to give the maritime world a practical instrument designed upon the scientific principles of sound and capable of delivering the note best adapted to the atmospheric conditions under which it was operating.

As a result of the labors of the research and engineering departments of this corporation there has been placed on the market a line of sound producing and projecting mechanisms known as Heath Sirens. These sirens in a practical way have demonstrated ability to direct navigation under fog conditions. They have been tried out with success on the ferry slips of San Francisco Bay and on various buildings ashore.

As shown by our illustrations, these Heath sirens are made in various types. One type may be hung under the bridge or in other locations like a ship's bell. This type is adaptable to freighters.

Another type is arranged for bolting to the deck or the top of deck house or to mast platforms, and is

(Continued on page 282)

Suspension type.

Work boat and pleasure craft type

Pier-head type.

MORSE FUEL OIL BURNING SYSTEM

A New Burner Giving Perfect Regulation at Constant Pressure with Perfect Atomization

SUCH a radical change as that from coal to oil for steam raising, as well as for special process industrial work, still meets with some opposition. Others, while having no definite opinion in the matter, require to be convinced, first, of the advantages to be obtained, and, second, as to the best type of oil burning installation for their particular requirements. In their latest literature, the Morse Dry Dock & Repair Company have discussed the subject from every angle and have endeavored to guide the prospective user in the selection of the proper equipment.

The Morse furnace front arranged for either natural or forced draft.

The Morse system is based on the principle of forcing fuel oil at proper pressures through a burner or atomizer, which can be regulated without changing the pump pressure. Following this controlled and fine atomization, the supply of air for combustion, under complete regulation, enters the fire box at sufficient velocity (due to Venturi design of the air register) and at right angles to the oil spray, so that a perfect mixture takes place at the burner tip. Both the oil and the air enter the combustion chamber in a whirling motion, so arranged that every minute particle of oil is surrounded by the proper amount of air. As a result, no unmixed or uncontrolled air is admitted to the combustion space. The advantages and benefits are obvious.

Following are some of the important features of the Morse fuel oil system:

1. On account of adequate pressure being used and the fact that the oil is properly heated to reduce viscosity, it is possible to use oil which has a specific gravity of 12 degrees Baume and upward. This heavy oil costs only about 60 per cent (on a basis of equal heat units) as much as does the lighter oil of about 22 degrees. Naturally there is an economy apparent from this feature.

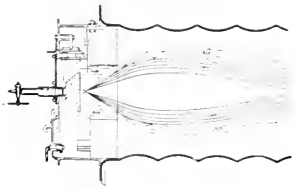
2. On account of the method of mixture of oil and air, the mixture becomes more complete and perfect in a much shorter distance, making complete combustion possible in a shorter time, thereby more fully utilizing the combustion and heating spaces.

3. When it is advisable to have slightly reduced conditions, or if it is necessary to shut off the air supply entirely, it is much more easily done with this type of control.

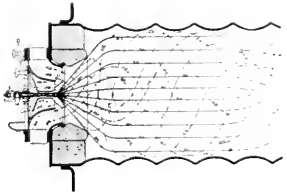
4. At other times, it is advisable and necessary to have an excess supply of air. This is very easily accomplished with the Morse burner, having the controls described above.

5. The chief advantage, however, is the absolute control which the operator has over his heat, regardless of drafts, or other outside influences. He can produce any type of flame he desires, reducing or oxydizing, short flame or long. He can force his heat to remote and inaccessible parts of the furnace or kiln, thereby overcoming many troubles and difficulties and uncertainty of results.

The Morse fuel oil system is manufactured by the Morse Dry Dock & Repair Company, Brooklyn, New York. They maintain a permanent combustion engineering staff, who will be glad to contribute their years of experience gained in fuel oil burning, to assist manufacturers in solving their combustion problems.



The Ordinary Way



The Morse Way

Diagrammatic representation of the flow of oil in the furnace of a Scotch marine boiler.

(Continued from page 281)

made of non-corrosive metal so as to be especially useful for motorboats, yachts and motorships.

Another type is arranged with parabolic reflector to throw the sound in a straight beam in the direction of the ship's motion. This latter type should appeal especially

Type for general harbor use.

to all craft such as police boats, fire boats, etc., which have and demand right of way in crowded traffic conditions.

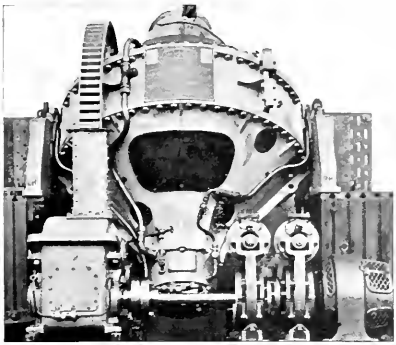
Perhaps the most interesting type of the Heath line of sound producers is the large automatic signalling siren which can be arranged to blow code numbers and which is undoubtedly the last word in audible warning signal apparatus.

All of the Heath sirens produce their notes through air pulsations induced by an electrically operated fan. The motors, fan rotors, and air passages are designed to give the best results for any given condition.

STABILIZER FOR NEW YACHT

THE new yacht Vanadis, designed by Cox & Stevens, for C. K. G. Billings, and built by the Krupp Shipyards, Kiel, Germany, recently arrived in America on her maiden voyage.

The Vanadis is diesel engined, the installation consisting of two 900-horsepower 6-cylinder Krupp engines. The Vanadis is 240 feet long, 35 feet beam, and 14 feet draft. She is thoroughly modern in every respect and is one of the most up-to-date vessels afloat.



The Sperry gyroscopic stabilizer for the yacht Vanadis, as set up for testing in the Sperry shops.

The Vanadis is equipped with the Sperry gyroscopic ship stabilizer, which will assure her of a calm passage in rough weather.

The Sperry gyroscopic ship stabilizer, which is placed forward of the main engines, contains a revolving element spinning at 1400 r. p. m. having a rotor of 6 feet 6 inches diameter with a 21-inch face, weighing 25,500 pounds. To spin this rotor a motor of 80 horsepower capacity is provided. The oscillating element is mounted in gudgeons fastened to the ship's hull; the gudgeons are provided with roller bearings through which the gyroscopic stabilizing moment is transmitted to the ship neutralizing the ship's roll. This moment of the torque delivered to the ship varies from zero to a maximum of 300 ton feet, depending upon the cycle of the ship rolling.

The moment is zero when the ship is just on the verge of changing its direction of roll, say from port to starboard, or vise versa, and it is maximum when the ship is passing through its upright position.

A precession motor of 15 horsepower actuates the oscillation of the gyro unit, being connected through a train of gears having a reduction of about 100 to 1. The control gyro, a sensitive element of the stabilizer equipment, automatically controls, by means of electrical contactors, the direction and rotation of the precession motor.

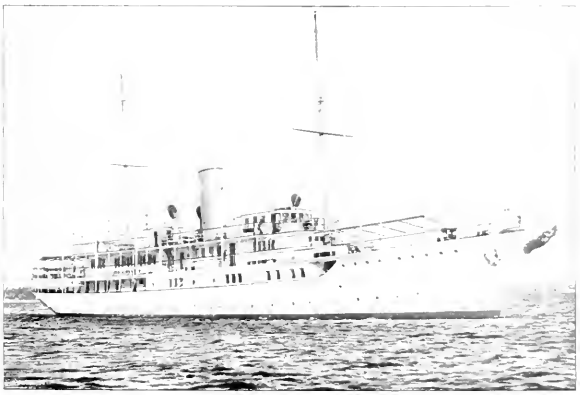
The theory of stabilization is interesting. To neutralize even the extreme rolling of the Vanadis, such as 30 or 40 degrees, the stabilizer need have a quenching power of only 5½ degrees for each single oscillation. This is due to the peculiar phenomena of the ship's roll whereby the waves gradually build up a large amplitude of oscillation and then crush this out as the waves come out of phase. Since the stabilizer need deliver only a small neutralizing force, it, therefore, reduces the stresses and strains.

The gyro does not have to fight the accumulated wave force; it takes each first wave in turn and gently neutralizes the effect of that one wave.

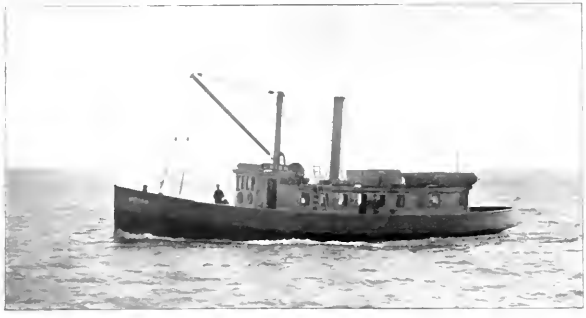
A HANDY REFRIGERATOR

Our illustration shows a new portable refrigerator, known as the "Dry Zero", which is manufactured by the Dry Zero Refrigerator Company of Oakland, California, and is distributed in California by the Dickie Supply Company of San Francisco. This refrigerator is of all metal construction with kapok specially treated insulation. It weighs only twenty-five pounds. A twelve-pound block of ice is sufficient to keep proper temperature for ordinary food for three days. The over-all dimensions, including handles, are: height 22" inches, length 24 inches, width 12" inches. In the food receptacle there is room to store with proper air space: 4 quart bottles of milk, a good sized leg of lamb, two squares of butter, a two heads of lettuce.

The convenience, portability and sanitary construction of this dry zero refrigerator should find for it great favor among yachtmen and owners of motorboats.



The new diesel-engined seagoing yacht Vanadis, designed by Cox & Stevens, New York and built by the Krupp Shipyards, Kiel, Germany, for C. K. G. Billings of New York.



Tug Speeded Up

CAREFUL design in small details often leads to very large indirect results in over-all economy. This well known engineering maxim was well demonstrated recently through an inexpensive alteration made in propelling equipment of the tug Union by the engineer of the Cloverleaf Propeller Company, San Francisco.

The tug Union has a steel hull, built in 1898 by the Union Iron Works. She is 75 feet long, 20 feet beam, and 7 feet 7 inches molded depth. She is powered with a Scotch marine oil burning boiler, 7 feet 6 inches in diameter by 8 feet 5 inches long, and a 100 horsepower compound steam engine with cylinders 9-inch and 17-inch diameter and 12-inch stroke, running 200 revolutions a minute. She is used as a works tender, taking men and materials from the main Potrero works of the Union Plant to Hunters Point drydock, or to the Alameda works of the Bethlehem Shipbuilding Corporation.

An especially designed propeller of the Cloverleaf type was installed some months ago, and an immediate improvement in speed and in engine performance resulted. The improvement was most noticeable in maneuvering at docks, and as all of the trips are short with considerable stand-by time at dock, any improvement in maneuvering counts large in the over-all economy.

The testimony of the captain and chief engineer of the Union is that she makes a decided gain in time each trip over her former performance. This saving is estimated at 15 per cent. Taking it at 10 per cent and figuring the value of time to the boat and crew, this saving would pay for the propeller in less than a year. But in the case of the tug Union there should be added the value of transported men's time, and the value of prompt delivery, which two items would insure the return of the wheel investment many times during any one year.

See the engineers of the Cloverleaf Propeller Company before you decide on a propeller.

New Diamond Appointments

Lynn W. Nones, marine manager of the Diamond Power Specialty Corporation, visited the Pacific Coast during the month, surveying marine conditions in the Puget Sound, San Francisco Bay and Los Angeles districts.

Guy M. Thompson, with offices at 70 Marion street in Seattle, has been appointed Seattle and Portland representative for the DIAMOND marine account. This agency now handles the lines of France Packing Company, American Liquid Meter Company and the Flexitallic Gasket Company.

Announcement was also made of the appointment of Western Engineering Company as marine representative for the California district. This organization is adding the Diamond soot blowers to a very representative line of marine equipment, which includes the Kingsbury thrust bearings, Davis Engineering Corporation engine room auxiliaries, Warren steam pumps and the Hickman air separators.

Mr. Nones is returning from the Pacific Coast with an enthusiastic idea of the shipping situation and looks to a very successful year in the Pacific Coast market. Eighty-three vessels were installed with DIAMOND soot blowers during 1923, including liners of the Matson Navigation Company, Southern Pacific Lines, U. S. Steel Products Company and U. S. Shipping Board.

TRADE LITERATURE AND NEW BOOKS

Anderson Foundry and Machine Company, Anderson, Indiana, has issued a catalog of forty pages entitled "The Anderson Oil Engine 1923." This booklet describes the types H and K heavy fuel oil engines, and covers arguments in favor of this type of engine, description of design, operating principles, and type of construction. The book also contains information as to the manufacturing facilities of the Anderson Foundry and Machine Company, description and specifications of parts of the engine, Anderson auxiliaries, and a special equipment list. The book is profusely illustrated with cuts and tables.

The Sharples Specialty Company, with head offices at Twenty-third and Westmoreland streets, Philadelphia, Pennsylvania, has issued a very neat loose-leaf catalog entitled "Sharples Super Centrifugal Process and Sharples Super Centrifuge." The book contains many illustrations and tables and is divided into sections describing the following: The Sharples Super Centrifuge; The Super Centrifugal Treatment of Turbine Oils; Super Centrifugal Treatment of Diesel Lubricating Oil Marine and Stationary Types.

The New York Dry Dock Company, Inc., at Clifton, Staten Island, New York, recently published a very interesting booklet containing illustrations and descriptions of the company's plant, plant facilities, dry docks, shops, turbine department, diesel department, oil-tight tanker work, combustion engineering department, and a tribute to its man power.

Centrifugal blowers and compressors, and their applications in water gas, coke oven, and general industrial plants, are treated of in a catalog issued by the **De Laval Steam Turbine Company of Trenton, New**

Jersey. The apparatus described includes single stage and multi-stage blowers and compressors for pressures up to 125 pounds per square inch. The illustrations show numerous machines as installed in water gas plants, coal gas plants, and coke ovens, also as used as boosters in city gas distribution.

Such blowers and compressors are usually driven by steam turbines of the velocity or pressure stage types, depending upon the size and steam economy desired, or by electric motor. Where high pressures are desired at motor speeds, several stages of compression, or else speeding up gears, are employed.

The centrifugal blower or compressor has not only the advantages of simplicity and absence of friction and wear, but it also utilizes centrifugal force to purify the gas when solids or liquids are present. Besides the description of structural details, the publication contains chapters on blower and compressor characteristics and testing, together with a theoretical and practical treatment of the compression of gases and of the flow of gases through pipes and conduits.

NEW BOOKS ON THE EDITOR'S DESK

Here is a list of new books which we believe will be of interest to our readers. Complete reviews will be published in a later issue of Pacific Marine Review.

Financing Exports and Imports, by Allan B. Cook, assistant secretary, Asia Banking Corporation; former assistant treasurer, Willys Overland Company and John N. Willys Export Corporation; lecturer in Foreign Exchange, New York University School of Commerce, Accounts, and Finance. Published by The Ronald Press Company, New York City; price $2.50.

Industrial History of the United States, by Edward S. Cowdrick, member, Society of Industrial Engineers; formerly assistant to the president, Colorado Fuel and Iron Company. Published by The Ronald Press Company, New York.

Britain's Life-Boats, The story of a century of heroic service, by Major A. J. Dawson with information by H. R. H. The Prince of Wales, K.G. Published by Hodder & Stroughton, London, 7 6 net.

The Life of the Ancient East, by James Baikie. Published by The MacMillan Company, New York City, being some chapters of the romance of modern excavation. Price $4.

The Auxiliary Patrol, by E. Keble Chatterton. The story of the minesweepers, trawlers, drifters, motorboats, etc., who, as auxiliaries, afforded such valuable aid to the British Navy during the World War. Published by Sidgwick & Jackson, Ltd., 3 Adam street, Adelphia, London, W. C. 2; price 12 6.

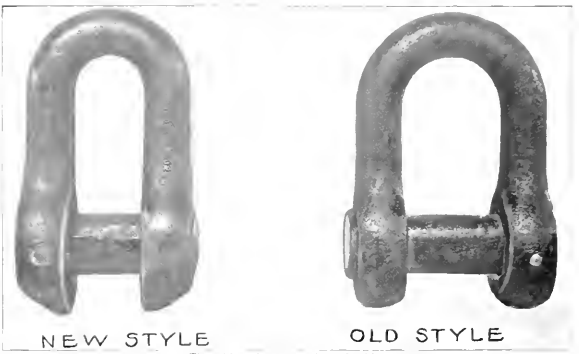
Increasing Human Efficiency in Businsss, by Walter Dill Scott. This is a new edition with a new chapter on personnel in industry. Published by The MacMillan Company, New York City; price $2.25.

The Sailors' Union of the Pacific, by Paul S. Taylor, Ph.D., instructor in economics, University of California. Published by The Ronald Press Company, New York City; price $2.50.

Cargo Handling at Ports, by Grysson Cunningham. A survey of the various systems in vogue with a consideration of their various merits. Published by John Wiley & Sons, New York City; price $3.50 net.

The Pirates' Own Book, or authentic narratives of the lives, exploits and executions of the most celebrated sea robbers, by Marine Research Society, Salem, Massachusetts; price $3.50.

Survivors of a Glorious Era: notable sailing ships which are still afloat. Published by The Syren and Shipping, Limited, 91, Leadenhall street, London, E. C. 3; price by post 10½d. (25 cents.)



The old and new anchor shackle

Improvement in Anchor Chains

IT takes courage in any field, and and especially in the field of marine engineering, to shake off the shackles of tradition. We are therefore very glad to announce that engineers of the National Malleable and Steel Casting Company, Cleveland, Ohio, manufactures of "Naco" cast steel anchor chains, have successfully attacked the problem of producing an improved shackle for anchor chains.

As will be seen from the illustration accompanying this article, which compares the new shackle and the old, there have been decided changes in a number of characteristics. The width between the shackle jaws has been reduced, which tends to strengthen the shackle, especially in the case of the anchor or bending shackle, and by actual tests the improved type has proved much stronger than the old style. This reduction in width also improves the fit of the shackle and makes for better operation of connecting shackles over the wildcat. This better fit, on account of the reduction in width, prevents the anchor or bending shackle from turning crosswise with the chain and anchor

A second improved characteristic is the beveled end, which not only makes for improved operation over the wildcat but places the bulk of the metal in the best location for taking the stress.

The final improvement is in the shape and style of shackle pin used, which substitutes a short Vee shoulder fitting in a countersink for the square holder head of the present style.

As a great portion of chain losses at sea have been due to defective shackle equipment, this improved and strengthened shackle should be very welcome to the maritime field.

MARE ISLAND MAKES GOOD

Big Repair Job on Steamship President Pierce Finished Within Estimated Time and Price to Satisfaction of Shipping Board and Pacific Mail

WHEN the United States Shipping Board awarded to Mare Island Navy Yard the machinery reconditioning of the passenger liner President Pierce, considerable doubt was expressed as to the ability of the yard to finish the job on time or within the estimated expenditure of funds. However, the vessel is now back in service with her machinery in as good as, if not better than, new condition and with many improvements, which are calculated to increase operating economy and decrease maintenance costs. The delivery time has been bettered by a good margin and, according to Navy Yard figures, the expenditures are well within the estimates.

The chief items of the work were complete retubing and practical rebuilding of the eight Yarrow water-tube boilers, renewing uptakes and stacks, overhaul and partial rebuilding of turbines, rearrangement and new equipment of engine and boiler room ventilation, overhaul of all steam piping, and a few minor alterations in passenger accommodations.

Many yard estimates for original contract, estimated extras and specification items calling for separate bids not included in original total, amounted in round figures to $311,000. This amount, together with the machinery and material supplied by the Shipping Board and the general repairs and docking charges at the Moore Dry Dock Company brings the total charges against the President Pierce for this lay-off from work up to the grand round figure of $420,000. We are credibly informed that there will be a profit to the government in the estimate, and that the latest check on the figures shows the cost to be about 15 per cent under the estimates.

Captain H. M. Gleason, assistant general manager, Pacific Mail Steamship Company, in charge of 535's.

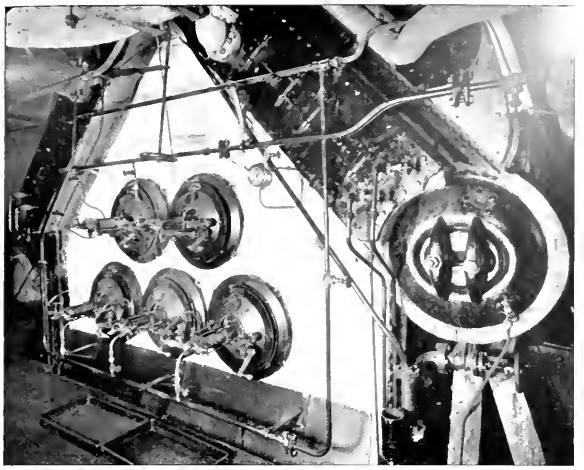
In retubing and reconstructing the boilers, five Todd burners were installed in each boiler instead of three, and the tubes were given as much spread as possible at the bends. Clean-outs were installed just above the lower drum on each side of each boiler, as shown in the illustration herewith.

The President Pierce was given a full power four-hour trial on April 8 with a large party of guests aboard. Her trim was 25.1 feet aft and 19.06 feet forward, with a mean draft of 22.08 feet. The machinery performed very satisfastorily and demonstrated its ability to maintain a sea speed of 17½ knots and to do better than 20 in a pinch. The average steam pressure at high pressure turbine throttle during the four hours full power run was 243 pounds.

A view of the waterfront of Mare Island Navy Yard, showing President Pierce and President Taft alongside outfitting dock. At right will be seen United States Army dredge Culebra.

A very marked improvement in the engine and fire room temperatures resulted from the rearrangement of the ventilating system. Highest temperature recorded in the engine room was 99 degrees Fahrenheit and highest at boiler room working platform 102 degrees. The carbon-dioxide tests showed ideal combustion, as did also the practical elimination of smoke at the stack. The experts of the Todd Oil Burning & Engineering Corporation, of the Shipping

View at the outfitting dock, Mare Island Navy Yard, showing one of hammer-head cranes on the pier and the 150-ton floating crane outboard.



same reconditioning job for the sister ship President Taft, and they feel that with the experience gained on the President Pierce they will show even better results at the trial of the President Taft.

The President Pierce sailed from San Francisco April 15 bound for Manila via Honolulu, Yokohama and Hongkong. She cleared from Honolulu on April 21, and from all accounts as we are going to press her boilers and turbines are living up to all of the expectations of the experts at Mare Island and of her operators. As she left San Francisco harbor much comment was aroused along the waterfront on the part of those who had watched her former exits as to the absence of smoke at her funnel. Nothing was discernible at the funnel's rim except a light brown haze, so that she is now up to the Shipping Board standard for such installations. "No smoking—this is an oil burner."

Above, the furnace front of the Yarrow type watertube boilers of the steamer President Pierce as reconstructed by Mare Island Navy Yard. Note the five Todd fuel oil burners. There are eight of these boilers on the President Pierce.

At left, hand holes for cleaning fitted into the shell casing of the watertube boilers on the President Pierce. Below, general view of the after fire room on the President Pierce, showing four furnace fronts and twenty Todd burners

Board, and of Mare Island Navy Yard are confident that now they have overcome the troubles in these boilers and that maintenance charges and delays will hereafter be reduced to a minimum.

George Walker and E. A. Oppelt of the Shipping Board, Captain H. M. Gleason, assistant general manager, and A. E. Moncaster, port engineer of the Pacific Mail Steamship Company, Captain G. T. January and Chief Engineer W. A. Dougan of the President Pierce, together with the office drafting room and shops personnel at Mare Island, have cooperated in splendid fashion to put out the President Pierce (the first large job of its kind in a Pacific Coast Navy Yard) as a real sample of honest craftsmanship and engineering ability.

The Navy Yard at Mare Island is now working on practically the

PORTS OF THE PACIFIC

IMPROVEMENTS DEVELOPMENTS ACTIVITIES

Seattle was the second port of the United States in value of imports for the seven months ending January 31, 1924. Imports through the port of Seattle for the period mentioned above were valued at $180,005,981. Silk, imported from Japan to the silk mills of the East, was the leading factor in the large import trade accruing to this port. The silk is brought direct from Yokohama (or at the present time from Kobe) on vessels of the Admiral Oriental Line, the Nippon Yusen Kaisha, and the Osaka Shosen Kaisha. There it is loaded onto fast express trains, which are held in readiness at the docks to receive the cargo, and rushed to the silk mills in the East. The Admiral Oriental Line claims that only 15½ days are required in these express shipments from Yokohama to New York, via their line.

The Port Commission is considering the installation of a canned salmon conveying system at the Spokane street terminal, which would increase the handling of this important product of Alaska and the Pacific Northwest.

Portland. Demand for space for moving lumber is much greater than the supply at present rates. It is estimated that not less than 100,000,000 feet of lumber is booked to move from Columbia river and Puget Sound during the next two months. Lumber rates range from $14 to $15 a thousand.

Federal dredges operating in the Columbia river have been laid up until after the June freshet of the Columbia river recedes. Portions of the river have been dredged to a depth of 40 feet, while the maintained depth should be only 30 feet. This is an experiment, engineers hoping that the silt carried down by the June freshet will be deposited in the deeper cuts and prevent shoaling and thus preserve the prescribed depth of river.

The Commission of Public Docks at Portland has received bids for the erection of two 2500-barrel capacity steel tanks for oil and molasses storage. The Pittsburgh Des Moines Steel Company was low bidder.

Astoria may have a large fueling and distributing plant if the plans of the Standard Oil Company to erect such a plant materialize. The Standard Oil Company will probably lease five acres of the port property west of Pier 3, upon which to construct its tanks. Pipe lines will be run to Pier 2 for the discharge of oil from the tankers and for the fueling of vessels. The plant would cost in the neighborhood of $100,000.

The port of Astoria will expend from $15,000 to $20,000 during the coming summer for repairs to its property and for new equipment.

San Francisco. Ships arriving and departing from San Francisco during the first three months of 1924 totaled 3221, an increase of 158 over the corresponding quarter a year ago. These 3221 arrivals and departures represent a tonnage of 7,225,260.

Oakland. The growth of this city as an industrial center is being recognized by ship operators and the city itself is making extensive plans for the deepening of the harbor and building of docks to meet the growing demand from shippers for direct shipping facilities. The American-Hawaiian Steamship Company and the McCormick Steamship Company have both included Oakland as a regular port of call.

Work has started on the large terminal for the Alaska Packers' Association on the Alameda side of the Oakland estuary.

Los Angeles Harbor held the leading position in intercoastal tonnage for 1923, according to figures compiled by the Bureau of Research of the United States Shipping Board. Intercoastal cargo movement for 1923 showed a total of 12,400,000 tons, 9,600,000 eastbound and 2,800,000 westbound. Of this amount 4,435,000 tons were made up of crude petroleum shipments from California fields.

The Harbor Board on April 15 received bids for the construction of two 2-story sheds on the Union Pacific lease on Terminal Island. That of the Lynch-Cannon Engineering Company for $852,400 was lowest. Awarding of the contract was postponed, however, until the members of the board could satisfy themselves by visiting other ports that the 2-story shed was successful.

The Army Board of Engineers has authorized survey of the breakwater at Los Angeles harbor with view to its extension.

Long Beach. The special election to vote $3,500,000 worth of harbor improvement bonds at Long Beach, which was to have been held the latter part of March, has been postponed until May 8, when a bond issue for harbor work of $5,000,000 will be voted upon.

San Diego has presented to the Navy Department a block of ground and waterfront site for the construction of a pier. The House Naval Affairs Committee has appropriated $300,000 to begin construction of the pier and car tracks and do the necessary dredging. The total cost of the improvements is estimated at $1,000,000 and are to be completed within two years.

Honolulu Harbor has been allotted from the current river and harbor improvement funds a sum of $110,000. Dredging work is now being carried on at the harbor in order that the port may be prepared for any emergency. The Hawaiian Dredging Company was awarded contract for $40,000 for dredging the

Canadian Pacific liner Empress of Canada entering Vancouver Harbor

slip between Piers 16 and 17 to a depth of 35 feet. Honolulu expects visits from a number of trans-Atlantic liners during the coming year and the Great British battle cruiser Hood is also expected at the harbor.

Vancouver has asked the government at Ottawa for a subquarantine station on Howe Sound, about four miles from the port, in order to facilitate handling of emigrants and dispatch of vessels.

The Robin Hood Flour Milling Company, Ltd., one of the largest milling concerns in Western Canada, plans construction of docking and wharfage facilities on the Vancouver waterfront this year for the accommodation of the company's commerce with the Orient. The new developments will take place on a 900-foot frontage in the vicinity of Kamloops street and will cost approximately $500,000.

Kobe, Japan. Due to the destruction of of hotels in Yokohama during the earthquake of September 1, emigrants are making Kobe the chief port of embarkation. Formerly, emigrants from points north of Yokohama departed from Yokohama and those from points south joined ship at Kobe, but now practically all emigrants are being routed to Kobe.

The foreign commerce of Japan did not show much increase during February. The exports equaled only about one-half of the imports during the month. Exports for the month of February, 1924, amounted to 104,792,000 yen as against 122,876,000 yen for the same month of 1923; imports amounted to 201,286,000 for February, 1924, as against 155,452,000 yen for February, 1922, making a difference of 96,494,000 yen imports for February, 1924, as compared with 32,576,000 yen for February, 1923.

Charter and Freight Report

April 23, 1924.

The utter absence of business in charters continues as in our last report under date of March 19.

Grain space from this port and from the North Pacific to the United Kingdom and Continent ranges from 30 - to 32 6, according to position, and full cargo fixtures on the same commodity at 32 6 to 33 9. The following fixtures are reported for wheat from the North Pacific: British stmr. Jersey City, fixed in Feb. for Apr. loading at 38 9; British stmr. Great City by C. Dreyfuss at 32 6, Apr. loading; Japanese stmr. Wales Maru by Strauss & Co., terms private; British stmr. Eastern City by Bunge Western Grain Corp., 33 9, Apr. loading; Dutch stmr. Eibergen, British stmr. King Idwal and British stmr. Sellasia, terms private; British stmr. Aldebaran, 32 6; British stmr. Volumnia, British Columbia to Mediterranean, 33 9, C. Dreyfuss; British stmr. Kilnsea, North Pacific-Mediterranean, 37 6 (old fixture), Apr.-May; British stmr. Dundrennan, United Kingdom, Balfour, Guthrie & Co., terms private; Swedish stmr. Strassa, North Pacific, United Kingdom Continent, 33 9, May loading, Kerr, Gifford & Co.; British stmr. King Alfred, May loading, by Strauss & Co., terms private; British stmr. Benledi for United Kingdom, 35 -, May loading.

There has been no full cargo movement in grain for the Orient, the only fixtures reported being the British stmr. Dundrennan, fixed in Mar. for wheat for Shanghai at $6.75 per ton by Balfour, Guthrie & Co., which business was not carried out owing to the steamer having missed her cancelling date. American steamer Commercial Scout, sold for delivery in the Orient, was fixed for flour from Astoria to Hongkong at $5 per short ton.

Lumber from this coast to Australia, Japan and the West Coast of South America remains practically at a standstill with the exception of lots going forward by the regular steamship lines, and we have no full cargo fixtures to report in the directions named with the exception of the Norwegian stmr. Loch Tay taken by the General Steamship Co. from W. L. Comyn & Co., the time chartered owners, to be used partly for lumber and partly for general merchandise.

For South Africa, British stmr. Eastern City has been taken at $18.50 per thousand feet by Heatley & Co., London, June loading, from British Columbia.

Rates for lumber from the North Pacific to the Atlantic seaboard north of Hatteras have declined on foreign steamers since the writing of our last report from $14.50 to $13 per thousand feet. On the other hand, American tonnage, which is hard to secure outside of the regular steamship lines, has advanced from $14.50 to $15.50 and one steamer is

TWENTY YEARS AGO

The illustration herewith is not a relic of the late war, but is taken from an old collection of photographs showing scenes in and around San Francisco at the opening of the present century. It shows the Grampus on her trials.

The Grampus was the first submarine built on the Pacific Coast and the first to navigate the waters of San Francisco Bay.

She is of the original Holland type built by the Union Iron Works, San Francisco, for the United States Navy and completed in 1903.

Note the number of old square riggers in the background.

reported as having secured $16. The following charters are reported for this business: British stmr. St. Bede, British Columbia, two ports north of Hatteras, $14.50, Mar. loading, chartered by the South Alberta Lumber & Supply Co.; Norwegian stmr. Frogner, same business and same charterers, terms private, the reported rate, however, being $14; Danish stmr. Kina for three ports North Hatteras, $14, same charterers; British stmr. Argalia, two ports of discharge, terms and charterers are not stated; Norwegian stmr. Hermion, two ports discharge, $14.50, April May, Canadian American Shipping Co., Ltd.; Italian stmr. Carnia, two ports discharge, May June, South Alberta Lumber & Supply Co.; Norwegian stmr. Augvald, two ports discharge, $13, same charterers; British stmr. Canadian Winner, British Columbia, for Montreal, Apr. loading, terms private; British stmr. Margaret Caughlan, British Columbia, for St. John and Montreal, terms private; American stmr. Carolinian, North Pacific, two ports discharge, $13.50, May loading, South Alberta Lumber & Supply Co.; American motorship Frank Lynch to New York, $15.50, Apr. loading, same charterers. Sudden & Christenson are reported as having fixed one of their steamers for prompt loading, two ports North Hatteras, $16.

British stmr. Alaska has been fixed to load coal from Newcastle, Australia, for Chile at 19/3 per ton and the same steamer after discharge of her coal cargo at Chile will load nitrate there for Honolulu for account of Balfour, Guthrie & Co. at $5.50 per ton.

For the Alaska trade, motorship Challamba has been taken on time charter by the Everett Packing Co., terms private.

A steady movement of crude petroleum, on old contracts, for the Atlantic seaboard from this coast, continues, the fixtures for American tankers for this business being as follows: Imlay, San Pedro to Boston, $1 per barrel, March; Betterton, California port to New York, 85 cents, May; Miskianza, to New York, two trips, 85 cents, May; Clement R. Smith, to New York, two trips, 85 cents, May; Betterton, San Pedro, north of Hatteras, 85 cents, prompt, March; Mary Luckenbach, California ports, three to four trips north of Hatteras, 84 cents. On the 17th instant seven American tankers are reported as being fixed for one year's business between this coast and the Atlantic seaboard. Neither the charterers nor the basis upon which the fixtures are made have been disclosed up to the present time.

In sales, the sailing ship Harvesthude, formerly under the German flag, has been sold to James Griffiths & Sons, Seattle, for barge purposes; Mexican stmr. Domingo Nazabal I. sold to the Inter Island Steam Navigation Co., terms private; sailing vessel Muscoota, to the Wallarah Coal Co. of Sydney, terms private.

PAGE BROTHERS, Brokers.

MORSE EQUIPMENT ON "MARU" BOATS

THE steamship Biyo Maru, recently at Staten Island, New York City, is the sixth vessel of the Toyo Kisen Kaisha to be converted to the Morse fuel oil burning system. This boat has the distinction of being the only electric driven ship in the Japanese merchant marine.

It is interesting to note that the Biyo Maru left New York harbor using only two of her boilers, whereas formerly she had to use all of her boilers constantly in order to give her the required steam.

Following is a list of other recent oil burning installations made by the Morse Dry Dock & Repair Company of Brooklyn, New York, including five ships of the Toyo Kisen Kaisha: Monticello, Nickerie, Dorothy Bradford, Algeria, Woyo Maru, Meiyo Maru, Choyo Maru, Hayo Maru, Koyo Maru.

It is evident from the above that the Morse fuel oil burning system has made rapid progress, considering the short time it has been on the market.

It is gratifying to note that foreign shipping companies are placing more and more confidence in American manufactured equipment of this type.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

[illegible] Marine Review, published monthly at San Francisco, Cal. for April 1, 1924.

State of California, County of San Francisco, ss.

Before me, a notary public in and for the State aforesaid, personally appeared E. N. De Rochie, who, having been duly sworn according to law, deposes and says that he is the manager of the Pacific Marine Review and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, H. S. Hines, 576 Sacramento St., San Francisco, Cal.

Editor, A. J. Dickie, 1636 Mariposa Ave., Berkeley, Cal.

Managing Editor, none.

Business Manager, E. N. De Rochie, 945 Josephine Ave., Berkeley, Cal.

2. That the owner is: (If the publication is owned by a corporation, its name and address, must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

H. S. Hines, 576 Sacramento St., San Francisco, Cal.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are (If there are none, so state.)

None.

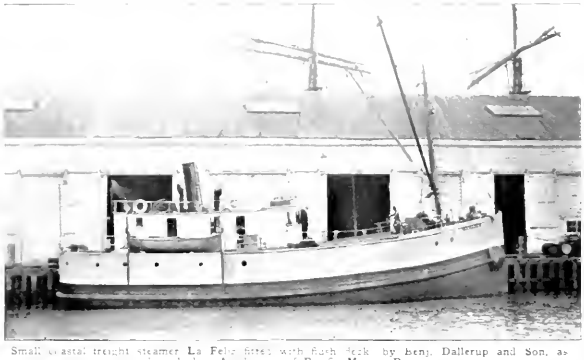
4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

E. N. DE ROCHIE,
Business Manager.

Sworn to and subscribed before me this 28th day of March, 1924.

E. M. CLARK,
Notary Public in and for the City and County of San Francisco, State of California.

(My commission expires April 22, 1924.)



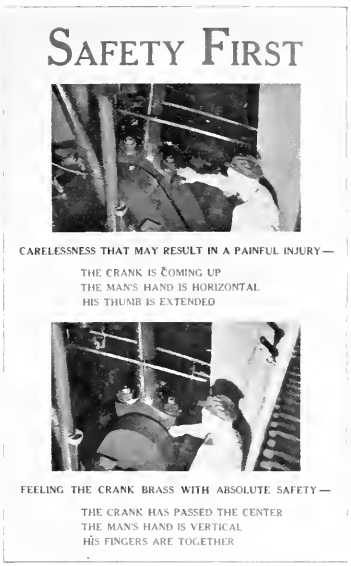
Small coastal freight steamer La Feja fitted with Fuel Oil by Benj. Dallerup and Son, as described in April issue of Pacific Marine Review

MARINE INSURANCE

DEVELOPMENTS OF THE MONTH

By CHARLES F. HOWELL, Contributing Editor

ONE of the worst weeks of late years, from the viewpoint of the marine underwriter, was that which preceded the advent of April. Founderings and collisions ran amuck, and the insurance man must pay the bill. It was heralded in by the sinking of the Ward freighter Santiago, bound for New York from Cienfuegos, Cuba, with a full cargo of sugar. She went down, sixty miles south of Hatteras, entailing the loss of several lives and of much valuable property. She was built in Scotland in 1906, and her gross tonnage was 3325. Her hull and machinery were valued at $240,000, and the participation of the Syndicates in this coverage was 25 per cent, or $60,000, of which about 40 per cent was written in the New York market and the balance in London. There was also about $75,000 on disbursements. At first there was a disposition to question the seaworthiness of the vessel, as she had been aground twice in the recent past, and some of the underwriters felt inclined to go back of the surveyors' reports; but this blew over. The real lesson taught by this expensive bit of experience was write sugar at a better rate than those recently prevailing. Rival offices had been raiding accounts until the rate had reached a minimum.



A Chapter of Disasters

A few days after the street had partly recovered from the staggering blow inflicted by the Santiago, another calamity developed along the same lines and with more sugar to pay for. The Atlantic fruit liner Glyndon went down off Hatteras with the loss of three lives and a sugar cargo of an insured value of $450,000. The hull was valued at $300,000. She was built at Portland, Oregon, in 1919, and was of 1672 net tons and 2722 gross. Her hull insurance was placed in London, along with $75,000 on disbursements. The cargo cover was handled in New York, where about 40 per cent of it was retained, the balance going to London.

Just about the time the Glyndon was disappearing under the waters of the Atlantic a serious casualty occurred in New York harbor. The White Star liner Olympic, in backing out from her pier, collided with the Fort St. George, of the Furness-Bermuda line, inflicting so much damage that the latter had to transfer her passengers to a rival boat and lay up for repairs. It was more good luck than good management that this was not an out-and-out sinking, but it will cost the London underwriters enough as it is. Divers examined the Olympic and she proceeded on her way, but the casualty had opened her f. p. a. warranties and had a subsequent accident occurred the question of seaworthiness might have been raised.

Then came news of the collision in the Thames estuary between the American steamer American Merchant and the British freighter Matatua, involving a loss of eight lives. The Britisher had a hole stove in her forecastle 50 by 30 feet and she was lucky to be beached at all. Another smashing blow for the London underwriters.

The climax was capped by the stranding of the Dollar liner President Monroe on Pacific Reef, thirty-two miles south of Miami, Florida, and about five miles off the coast. She was of the round-the-world service, and was bound from New York for the Pacific, via the Panama Canal, with thirty-three passengers and a cargo of general merchandise. She was floated, after a day or two of effort, but the stranding opened her f. p. a. warranties under the English form; under the American form there is liability only for loss occasioned by a stranding. It is understood that the President Monroe's insurance was placed in London. Underwriters have been rather chary about writing these round-the-world cruises because of the extra hazards involved and because there has been little experience to go upon. The hull rate for such a trip runs from 5 to 6 per cent.

Undischarged Sugar

There has been an unusual accumulation of sugar at New York's various discharging points, resulting from a dull market combined with

which event the count will be based on the actual steamer's count.

"For purposes of marine insurance the same procedure will be followed, but it is agreed that in event of an excess in outturn the assured will pay premium on such excess on the basis of 30 per cent and, in turn, they will be fully protected by the company for loss; otherwise recoverable, if such excess has been known and properly declared and insured."

Port Labor Hazards

It is almost a matter of daily news to learn of serious or trifling labor disturbances at prominent shipping ports, and it therefore becomes a matter of prime importance that merchants exercise every care to have themselves properly insured against loss from such sources. Word from Bremen indicates that all discharging ceased recently, excepting goods of a perishable nature, probably the food for the relief of German children, and this was being handled by volunteers. This has been a source of anxiety to shippers of large cargoes of cotton and packinghouse products, as they face the additional hazards of delay. Several vessels that have been unable to discharge at Bremen have been compelled to start on a return trip with their cargo unbroken. As these vessels have arrived at their port of destination, this turnabout constitutes an abandonment of the voyage, and that is not covered by the deviation clause. Consequently, the shippers are without insurance unless, first, their bills of lading grant permission to make such a turnabout, or, second, their insurance policies contain the following clause:

"Held covered, at premium to be arranged, in case of variation of the risk by reason of the exercise of any liberty granted to the shipowner or charterer under the contract of affreightment."

In the New York market a strike rate of ¼ per cent for ten days has been quoted.

Oil Odors in Flour

It is sometimes asked whether the absorption of oil odors by flour is a risk within the meaning of the "all risks" clause under which mill flour shipments are regularly insured. It has always been the content of underwriters that there is a difference between a risk of transportation and an incident of transportation. A risk is the happening of some circumstance apart from and in addition always found to exist on the particular voyage or in a particular trade. Thus, a usual dampness in the hold of a vessel is an incident of the voyage as distinguished from a risk of transportation. If an oil burning vessel's holds are always permeated with the odor of oil, it is an incident of the voyage, a condition always existing, and not a risk. On the other hand, if the odor were due to leaky tanks, or leakage of pipes, any damage arising would be the result of a risk of transportation, and not an incident.

News from the Offices

Due to the growth of its [illegible] marine business, the Automobile Insurance Company of Hartford has found it necessary to organize a new foreign marine department, with headquarters at the home office. Fred Maccabe has been placed here in charge. He will be assisted by A. H. Fitzgerald, formerly a representative at London. Mr. Maccabe has been engaged in marine insurance for twenty years, having spent fifteen of them with the Standard Marine [illegible] and New York [illegible] Automobile [illegible] he has been in charge [illegible] loss department of New York [illegible]

At the recent annual meeting [illegible] Underwriters Association [illegible] B. Vandervoort [illegible] vice-president [illegible] board of [illegible] elected [illegible] Francisco [illegible] David H. [illegible] DeLima, vice-president and general manager, Imre Temesvari, treasurer, Edward J. Entenmann, secretaries, William J. Charmack and Charles B. Kent. Six new members were elected to the board of directors.

Thomas F. Christie, chief marine surveyor of the New York firm of Holmes, Browning & Company, Inc., died suddenly of heart disease while being driven home in a cab on February 25. He was 45 years of age.

Edgar Eugene Lethbridge, senior member of Lethbridge & Cornwell, one of the oldest inland marine firms of New York, died of heart disease at his home in South Orange, New Jersey, on March 2. He was 59 years of age, and was highly esteemed by the underwriting fraternity for his ability and his many splendid traits of character. He had, at the time, been the speaker of the New Jersey state assembly, and was an ex-president of the Marine Exchange of New York.

Alexander Wilson, formerly with the surveying firm of Eads Johnson, has been appointed chief marine surveyor of Holmes, Browning & Company, Inc., filling the vacancy created by the death of the late Thomas F. Christie. This firm has opened a branch office in the Ellicott Square building, Buffalo, where they will specialize on Lake [illegible] and cargo surveying. Captain F. W. Holmes will be in charge.

S. W. Stanwood, long connected with the New York [illegible] W. A. Peck & Hughes, and [illegible] of the late Underwriters Association [illegible] the general [illegible] charge [illegible] S. Kenny [illegible] New York [illegible] Kenny [illegible] promotion [illegible] Stanwood [illegible] David H. [illegible]

E. T. King, for many years with Chubb & Son, has gone to San Francisco to join the staff of the marine general agency firm of Rathbone, King & Seeley, Inc.

Sir Joseph Lowrey, secretary of the London Salvage Association, has returned from Japan, where he has been engaged with Forrest Single in representing marine insurance interests of Great Britain and the United States in connection with the earthquake losses.

H. P. Murtha has terminated his connection with the Shippers' Underwriting Agency, where he has been engaged in work connected with the liquidation of accounts the agency had with the companies it formerly represented. His next move has not as yet been announced.

Platt, Fuller & Company, representatives at New York of the Insurance Company of North America, have been appointed fire managers of the National Security of Omaha, which the North America recently acquired. This branch of the business will be managed by C. Ammermuller, formerly with Darby, Hooper & McDaniel.

Only two cotton fires have been reported thus far in 1924, and both of them were caused by lightning.

Many underwriters have ceased insuring goods bound for ports in Honduras, as the United States government has severed diplomatic relations with that country. Serious losses will doubtless develop from the recent burning by revolutionists of the business section of La Ceiba, the principal port on the Caribbean.

The Motorship—Is it a Good Risk?

(Continued from page 276)

That was the gist of the story, feebly repeated by me, but, because it seems to have a message for owner, operator and underwriter, the repetition has been attempted.

In a recent marine insurance article in an allied periodical, I was surprised to read a poorly veiled attack on the marine diesel, from the underwriter's point of view. As will be shown later, the answer to this editorial was found in the same magazine under the new heading, a few pages further on. But when the facts are known—this immediate availability of power, this ability to put full power on the backing screw which is shared by no other form of marine prime mover, and other important but less vital characterstics—when these facts are known, it would seem that they would be sufficient to remove the prejudice of any impartial member of the insurance fraternity.

The answer that appealed to me in the periodical mentioned above was an announcement that the English government had endorsed the securities of an English company to the extent of $8,500,000 for the purpose of aiding the construction of twenty-one seagoing merchant ships, all equipped with diesel engines. Of course, if one does not consider that our English friends now anything about ships, or shipping, or foreign trade, or marine insurance, then this announcement will not mean anything. If one has the contrary opinion, there is food for thought in the announcement. Think it over.

Notes

An interesting merger is reported from Seattle. Frank A. Frederick and J. A. Graessner, both specializing in marine insurance, have consolidated under the new firm name of Frederick & Graessner. This new firm will continue general insurance with special emphasis on marine coverage.

At 12:30 o'clock on the morning of April 8, the Hawaiian Meat Company's freighter Bee struck a reef off the island of Maui and became a total loss. At 4 o'clock on April 11 the Fireman's Fund Insurance Company, through its Honolulu agents, paid the Hawaiian Meat Company the full loss of $100,000, eighty-seven and a half hours from disaster to full settlement—prompt work—showing the old reliable Fireman's Fund living up to its best traditions.

C. H. Williamson Company has acquired by purchase the insurance brokerage business and organization of Bruce H. Rutherford. his merger should tend to more effective brokerage service. Bruce H. Rutherford is to be manager of the enlarged firm.

SHIPBUILDING AND SHIP REPAIRING

A LOOK AT WORLD SHIPBUILDING THROUGH LLOYD'S REGISTER

WORLD shipbuilding at the end of the first quarter of 1924 shows an increase over the beginning of this year. This is stated to be due to the gain reported in the orders held by the shipyards of the United States and Great Britain and Ireland, most of the other nations showing a decrease from the totals reported three months ago. The gain of 78,000 gross tons for Britain and Ireland, and of 28,000 tons for this country were sufficient to more than offset the loss of 34,000 tons for all other countries combined.

The United States, which three months ago stood sixth among the nations of the world in ship construction, now ranks fourth.

The following table shows the comparison in tonnage between the last two quarters, the figures representing gross tons:

	Mar. 31,'24	Dec. 31,'23
Great Britain and Ireland	1,473,629	1,395,181
United States	119,767	91,585
Other Countries	923,108	957,570
World total	2,516,504	2,444,336

These figures, however, include contracts on which suspensions of work have been ordered. The suspensions for Great Britain and Ireland aggregate 101,000 tons, as against 164,000 tons at the first of this year; and for other countries, 118,000 tons as compared with 67,000 tons three months ago. This makes the actual British construction under way, 1,372,000 tons, and for other countries, including the United States, 925,000 tons, or a world total of 2,297,000 tons, compared with 2,213,000 tons in the previous quarter.

The returns for construction work being done in all countries under Lloyd's Register supervision, and intended to be classed with that society, show an aggregate of 1,517,859 gross tons, compared with 1,360,067 in the previous quarter, and 1,268,571 tons in the one before that. Of the present total, 1,152,063 tons is for construction in the yards of Great Britain and Ireland, as against 1,085,362 tons, and 976,446 for the two previous quarters, respectively. More than 60 per cent of all the seagoing tonnage building throughout the world today, therefore, is being classed with Lloyd's, and nearly 80 per cent of the total for Great Britain and Ireland.

Thirty Per Cent Motorships

A feature of the returns is the prominent part that the construction of motor vessels is now taking in world shipbuilding. Of this class of ships the total now under construction in Great Britain and Ireland aggregates 325,190 gross tons, and in all other countries, 369,522 tons, a world total of 694,712 tons, or nearly 30 per cent of the total for all construction. During the entire year, 1923, motorships launched aggregated only 226,000 tons, and for 1922, the figure was 209,000 tons.

Tankers

A small gain was shown during the quarter just ended in the tankers under construction (including all steamers and motor tank vessels of 1000 gross tons and above). The following table shows the comparison for the last two quarters in gross tons:

	Mar. 31, '24	Dec. 31, '23
Great Britain and Ireland	74,600	83,646
United States	12,050	12,050
Other Countries	97,200	79,468
World total	183,850	175,164

New Contracts

New work commenced during the last quarter fell considerably short of the volume of launchings, while in the previous quarter the reverse was the case. During the first three months of this year new construction begun in British and Irish shipyards was 135,000 tons less than the tonnage sent down the ways; but for all other countries combined, the launchings were less than the new work by about 15,000 tons.

Germany retains second place, with about 300,000 tons under construction, but this represents a decrease of nearly 40,000 tons from the previous quarter. In addition to the United States, Italy, France, and Japan made slight tonnage gains; but Germany is building as much shipping as the United States, France and Japan combined. Great Britain's lead over Germany in construction, which was 1,059,000 tons at the beginning of the year, has now increased to 1,174,000 tons.

The ranking of the various countries in shipbuilding now, as compared with the beginning of the year is shown by Lloyd's Register to be as follows, in gross tons:

	Mar. 31, '24	Dec. 31, '23
Great Britain and Ireland	1,473,000	1,395,000
Germany	299,000	336,000
Italy	130,000	119,000
United States	119,000	91,000
France	111,000	110,000
Holland	106,000	112,000
Japan	72,000	63,000
British Dominions	27,000	33,000

The proportion of the world shipbuilding being done in this country, Great Britain and Ireland, and all other countries combined, is as follows, compared with three months ago:

	Mar. 31, '24	Dec. 31, '23
United States	4.8%	3.8%
Great Britain and Ireland	58.5%	57.1%
Other Countries	36.7%	39.1%

The total of 2,516,000 gross tons of shipbuilding for the world now compares with 3,162,000 tons just before the late war. On June 30, 1914, however, British yards and German yards were at that time each building about 250,000 tons more than now, and American about 30,000 tons above the present figure. Great Britain's proportionate share of the total was less then than now, however, representing 54.4 per cent to 4.7 per cent for the United States, and 40.9 per cent for all other countries combined.

Recent Contracts

Newport News Shipbuilding & Drydock Company has landed the most important shipbuilding contract of the month. They have been authorized by H. H. Raymond, president of the Clyde Mallory Lines, to build two express coastwise passenger liners for the New York, Charleston, Jacksonville route. These vessels will have the following principal characteristics:

Length between perpendiculars, 387 feet 6 inches; molded beam, 54 feet; depth molded to hurricane deck, 31 feet 6 inches. They will be fitted with Scotch marine type boilers and geared turbines, giving a horsepower of 4200 and a speed of 15½ knots. The deadweight carrying capacity, at 18 feet draft, will be 2700 tons. Modern accommodations are being provided for 330 first-class and 80 steerage passengers, and the full crew complement will be 120.

Perhaps the most progressive step taken in the design of these steamers is the installation of electrically operated deck winches and windlass. The total cost of these two ships will be in the neighborhood of $3,500,000.

Bethlehem Shipbuilding Corporation, Union Plant, has a contract from the San Francisco-Richmond Transportation Company for three steel hull passenger and automobile ferryboats for this service. The boats will be 246 feet long, 60-6 feet beam, and 19-3 feet depth; will be equipped with steam driven reciprocating engines of about 1500 indicated horsepower; steam will be supplied by watertube boilers. The vessels will accommodate about 80 automobiles each.

The Hawaiian Meat Company of Honolulu has also placed an order with this company for a passenger and cattle boat for the Hawaiian service. The vessel will be 210 feet long, 36 feet beam, 16 feet depth, with triple expansion engines of 1200 horsepower; and will cost in the neighborhood of $450,000.

American Bridge Co., Pittsburgh, 12 barges for the Tennessee Coal, Iron & Railroad Co., 140 by 25 by 8½ feet.

Great Lakes Engineering Works, River Rouge, Mich., has an order for a bulk freighter for the Columbia Steamship Co. of Cleveland. The steamer will be 592 L.B.P., 62 beam, and 25 draft, will have a capacity of 3500 tons deadweight and a speed of 12½ miles.

Marietta Manufacturing Co., Point Pleasant, W. Va., has orders for two sternwheel towboats 125 by 30 by 5-2 feet; a ferryboat 70 by 15 by 3-6 feet; and a ferry motor towboat 55 by 13 by 3 feet.

The Pusey & Jones Co., Wilmington, Del., has an order for a combination passenger and freight steamer to be of steel for the Norfolk & Washington Steamboat Co. The vessel will be 297-7 L.B.P., 51 beam, 13 loaded draft; she will have a deadweight capacity of about 1600 tons and a speed of about 18 miles. The vessel will be propelled by triple expansion engines generating 2400 indicated horsepower, steam to be supplied by four Scotch boilers 12 feet 6 inches long. The keel will be laid in May.

The Moore Dry Dock Co., Oakland, Cal., has an order for an oil barge for the Associated Oil Company of San Francisco. The vessel will be twin screw, 140 feet long, 30 feet beam, 9.6 feet depth, and will be equipped with 220 B.H.P. Pacific diesel engines. The bid submitted was $119,322, to be completed in 125 days.

Los Angeles Shipbuilding & Drydock Corporation has an order from the Standard Oil Co. (Calif.) for a steel oil barge for harbor transportation of petroleum products. The barge will be 110 feet long, with a beam of 37 feet 10 inches and a depth of 8 feet, and will have a capacity of 3600 barrels.

New York Shipbuilding Corporation has an order for two 3-track carfloats, 270 feet long, for the Harlem Transfer Co. and an order for five 2-track carfloats, 366 feet long, for the New York Central R. R. Co.

Keel Layings

Two barges, Hudson River Day Line, Bethlehem Shipbuilding Corp., Sparrows Point, Mar. 13.

Steel oil barge, Mexican Pet. Co., Federal Shipbuilding Co., Mar. 31.

Dump scow, Great Lakes Dredge & Dock Co., Great Lakes Engineering Works, Ashtabula, O., Mar. 15.

Steel barge, U. S. War Dept., Manitowoc Shipbuilding Corp., Manitowoc, Wis., Mar. 28.

George Washington and Robert E. Lee, combination steamers, Old Dominion Line, Newport News Shipbuilding & Drydock Corp., Mar. 10 and 12.

Launchings

Aras, yacht, Hugh J. Chisholm, Bath Iron Works, Mar. 17.

Pere Marquette 21, car ferry, Pere Marquette Ry. Co., Manitowoc Shipbuilding Corpn., Manitowoc, Wis., Mar. 18.

Sailor, towboat. Jones & Laughlin Steel Corp., Marietta Manufacturing Co., Mar. 28.

Dan C. Kingman, hopper dredge, U. S. Engineers. Sun Shipbuilding Co., Mar. 22.

Priscilla, bulk oil stock, New York Shipbuilding Corp., Mar. 20.

Deliveries

Two steel barges, Shell Oil Co. (Calif.), Bethlehem Shipbuilding Corp., San Francisco, Mar. 8 and 20.

Oil barge, Seaboard Shipping Co., Federal Shipbuilding Co., Mar. 11.

Flat scow, M. Sullivan, Detroit, Great Lakes Engineering Works, River Rouge, Mich., Mar. 20.

Island Queen II, sidewheeler, Coney Island Amusement Co., Cincinnati, O., Midland Barge Co., Midland, Pa., Mar. 24. (This was the steamer Louisville built for the Louiville & Cincinnati Packet Co. but sold by them on completion.)

Oil barge, Sun Oil Co., Sun Shipbuilding Co., Apr. 5; oil barge, N. Y. Central R. R. Co., Apr. 3; oil barge, Tidewater Oil Co., Apr. 3.

William K. Field, bulk freighter, The Reiss Steamship Co., Sheboygan. Wis., Toledo Shipbuilding Co., Mar. 31.

Deck barge, T. L. Herbert, Nashville Bridge Co., Mar. 20.

Repair Awards

The Mare Island Navy Yard will recondition the United States Shipping Board liner President Taft. The yard submitted an estimate of $174,425; the Bethlehem Shipbuilding Corp. bid $189,900, and Moore Dry Dock Co. bid $214,918.

* * *

General Engineering & Drydock Co., Oakland. Calif.. was awarded contract to prepare for service the Shipping Board freighter Liberty Land, which has been laid up since August, 1921. A bid of $12,313 was submitted.

* * *

Bethlehem Shipbuilding Corp., San Francisco, has work of reconditioning the freighter Doylestown, operated by Charles Nelson Co. for the lumber carrying trade. The work will cost $23,147. This company also submitted low bid of $19,046.50 on April 4 on "betterments" to the Shipping Board liner Cleveland operated by the Pacific Mail Steamship Co.

Shipyard Notes

The Wallace Equipment Company of Seattle was awarded contract for the construction of steel hull and lower house of a 30-inch pipe line dredge for the Port of Portland. The hull will be fabricated in Seattle and will be built at the Halser Machine Works, Portland, Oregon. The amount of the contract is $165,000. The upper house will be of wood and work may be undertaken by the port. The work of installing the diesel engines will also be taken care of under other contracts.

* * *

The Monticello Steamship Company, San Francisco, has purchased the steamer Florida from the Baltimore Steam Packet Co. and will recondition her for the San Francisco-Vallejo service.

* * *

The Albina Marine Iron Works, Portland, Ore., has just completed work of converting the steamer North King from a coal to oil burner and other general repairs. She was formerly the German steamer Liebenfels.

* * *

The Alaska Steamship Company, which asked for bids some time ago to recondition the steamer Colon for the Alaska passenger and freight service, will perform the work themselves. The steamer will be renamed the Yukon and her first trip for Alaska is set for May 17.

* * *

Contracts for the first of the new fleet of speed boats for the Coast Guard service have been awarded on the East Coast. The Gibbs Gas Engine Company, Jacksonville, Florida, will construct five and Frederic S. Nock, Inc., East Greenwich, Rhode Island, will construct five 36-foot speed boats. The price bid by the Gibbs Gas Engine Company was $4700 each and by Frederic S. Nock, Inc., $4200 each. The engines for these boats will be provided under separate contract. The Sterling Engine Company, Buffalo, New York, received contract from the Coast Guard Service for 350 engines developing 200 horsepower for 36 and 75-foot speed boats, to cost $1,445,000. The engines will have 6 cylinders and be capable of developing a speed of from 18 to 28 knots. The Consolidated Shipbuilding Corporation, Morris Heights, New York, has also received a contract for 100 6-cylinder engines of 150 to 180 horsepower to cost $308,000.

* * *

Admiral Hideo Takeda, chairman of the board of directors of the Mitsubishi Shipbuilding Company, Tokyo, formerly of the Japanese Navy, is in California to study American methods of shipbuilding.

"We are especially interested in electrical motive equipment," said Admiral Takeda. "While we have internal oil-burners, none of our vessels as yet employs electricity. I am making a study of electric-driven ships on this coast and expect to visit the Westinghouse Company in the East to obtain further information on the subject."

Progress in Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT
Potrero Works

Purchasing Agent: O. W. Strettt.

Hull 5319, steel barge, Shell Oil Co.; 140 LB P.; 26 molded beam; 14 molded depth; keel Dec -23; launched Mar3 24; delivered Mar8 24.

Hull 5320, sister to above; keel Dec27/23; launched Mar19 24; delivered Mar20 24.

HANLON DRYDOCK & SHIPBUILDING COMPANY
Oakland, Calif.

Purchasing Agent: R. Barker.

Dan F. Hanlon, hull 89, steam schr D. I Hanlon, 2500 DWT; 1400 IHP engines; 2 Bo W boilers; launched Mar17 24.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
San Pedro, Calif.

Catalina, hull 42, excursion stmr, Wilmington Transp Co.; 285 LBP; 52 beam; 14 loaded draft; 16 loaded speed; twin screw 3 cyl TE engs, 3600 IHP; 4 B&W boilers; keel Dec26 23; launch May3 24, est.; deliver July1, 24, est.

No name, steel oil barge, Standard Oil Co. (Calif.); capacity 3600 bbls.; 110 LBP; 37-10 molded; 8 depth.

THE MOORE DRY DOCK CO.
Oakland, Calif.

Purchasing Agent: N. Lee.

No name, hull 167, oil barge, Associated Oil Co.; S. F.; 140 LBP; 30 beam; 7-6 loaded draft; 1 to 6 diesel engs; 220 BHP.

NAVY YARD
Puget Sound

Medusa, repair ship for government; 465 LBP; 70 beam; 24-9 loaded draft; 17-5 loaded speed; turbine engs, 5000 IHP; 2 WT express type boilers; 10,000 tons displ; keel Jan -20; launched Apr10 21; delivered May15 24, est.

Holland, submarine tender for government; 500 LBP; 65 beam; about 23 loaded draft; 16 K loaded speed; turbine engs, 7000 IHP; two WT express type boilers; 10,000 tons displ; keel Apr14 21; delivery Apr1 25, est.

JAS. ROBERTSON SHIPYARD
Alameda, Calif.

Ferryboat, double-end side-wheeler, Richmond-San Rafael Ferry Co.; 172 LBP; 38 beam; 9 loaded draft; 12 knots speed; 700 IHP cross comp engs; 2 drv back boilers, 9-2; keel Dec10/23; launch Apr21/24, est; deliver May20/24, est.

W. F. STONE & SON SHIPBUILDING COMPANY
Oakland, Calif.

Olive, hull 51, yacht, for F. A. Hyde; 50 LBP; 14 beam; 6 loaded draft; deliver May 1 24, est.

No name, hull 52, tug, Daniel Const. Co.; 65 LBP; 17 beam; 8 loaded draft; 150 IHP diesel eng; deliver May1/24, est.

Hull 53, barge, Naknek Packing Co.; 65 LBP; 24 beam; deliver Apr1, 24, est.

PRINCE RUPERT DRY DOCK & SHIPYARD
Prince Rupert, B. C.

Two cruiser hulls, 60 ft, for Dominion government Fisheries Service; deliver Mar30, 24, est.

TODD DRYDOCK & CONSTRUCTION CORPORATION
Tacoma, Wash.

Six steel barges, hulls 37-42 inc., U. S. Engineers, Portland, 120x34x7-6 feet; launch Apr1/24, est.

No name, hull 43, passenger and freight stmr, Southern Pacific Co.; 415 LOA; 57 beam; 24 loaded draft; 16 knots speed; 7000 DWT; keel Feb26 24.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty coal barges, Carnegie Steel Co., 175-26x11; deliver spring 1924.

Nineteen barges, U. S. Engineers, Louisville, Ky.; 110x26x6-6; deliver July 24, est.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft; deliver 1924, est.

Sixteen barges, U. S. Engineers, Louisville; 110x26x6-6; deliver Oct1 24, est.

Eight barges, U. S. Engineers, Florence, Ala.; 120x30x7; deliver July and Aug/24.

Fifteen barges, Amer. Steel & Wire Co., Pittsburgh; 100x26x9-3; deliver 1924.

Twelve barges, Penn. Coal, Iron & R. R. Co.; 140x25x8-6; deliver summer 1924.

THE AMERICAN SHIP BUILDING COMPANY
Lorain, Ohio

W. H. Gerhauser, vice-president and director of purchases.

Greater Detroit, hull 785, paddle stmr, Detroit & Cleveland Nav. Co.; 535 LBP; 98 beam; 16 loaded draft; 20 mi loaded speed; 3 cyl comp engs; 10,000 IHP; 6 SE and 3 DE Scotch boilers, 14x20; keel Feb10/23; launched Sept14/23; deliver spring 1924.

Greater Buffalo, hull 786; sister to above; keel May2 23; launched Oct27/23.

Henry Ford II, hull 788, bulk freighter, Ford Motor Co.; 590 LBP; 62 beam; 20 loaded draft; 13 loaded speed; 12,000 DWT; 3300 IHP; Doxford diesel engs; keel Dec10/23; launched Mar 1 24.

BATH IRON WORKS, LTD.
Bath, Maine

Purchasing Agent: J. L. P. Burke.

Light vessel 111, hull 92, second-class light vessel, U. S. Dept. of Commerce; 109-6 LBP; 30 beam; 14-4 loaded draft; 9½ speed; comp eng; 400 IHP; 2 Scotch boilers, 10-6x11-5; keel Aug21, 23.

Aras, hull 96, yacht for Hugh J. Chisholm; 118-4 LBP; 18-6 beam; 5-6 loaded draft; 15 mi loaded speed; two 6 cyl gas engs, total IHP 400; keel Dec1/23; launched Mar17 24; deliver June1, 24, est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT
Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N. Massachusets, hull 1400, battleship U.S.N.; to be scrapped.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT
Wilmington, Del.

Hull 3487, army barge U.S. Army; keel Nov10/23, launched Feb2 24.

Hull 3489, U. S. Army; keel Dec8 23; launched Feb2 24.

Hull 3490, carfloat, C. R. R. of N. J.; 325 LB P; 38-6 beam; 1030 gross tons.
Hull 3491; same as above.

BETHLEHEM SHIPBUILDING CORPORATION, SPARROWS POINT PLANT
Sparrows Point, Md.

Alexander Hamilton, hull 4217, passenger vessel, Hudson River Day Line; 325 LBP; 76 beam over guards; 13-8 deep; 1 TE eng, inclined, 3500 HP; 2 single and 2 double ended boilers; keel Apr2 23; launched Oct20/23.
Boston, hull 4218, passenger vessel Eastern Steamship Co.; 385 LBP; 72-6 beam; 23-9 molded depth; twin screw turbine engs, 6400 HP; 6 Scotch boilers; keel Mar13/23; launched Oct27/23; deliver Apr15/24, est.
New York, hull 4219, sister to above; keel Apr3/23; launched Jan12, 24; deliver May 15/24, est.
Hull 4222, oil barge, Standard Oil Co. (N. J.); 136 LOA; 23 molded beam; 3-6 depth; keel Feb 11/24; launch Apr./24, est.
Hull 4223, sister to above; keel Feb11/24; launch Apr./24, est.
Hull 4224, sister to above; keel Feb11/24; launch Apr./24, est.
Hull 4225, sister to above; keel Feb15/24; launch Apr./24, est.
Hull 4226, sister to above; keel Feb15/24; launch Apr./24, est.
Hull 4227, sister to above; keel Feb15/24; launch Apr./24, est.
Hull 4228, barge, Hudson River Day Line. 100x18x16 ft; keel Mar13/24.
Hull 4229, sister to above; keel Mar13/24.

CLINTON SHIPBUILDING & REPAIR COMPANY
Philadelphia, Pa.

No name, hull 45, oil barge, City of Phila.; 88 LBP; 30 beam; 8 loaded draft; keel June /24, est; launch July/24, est; deliver Aug. 24, est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Wig Wag, hull 2744, D. cruiser, H. S. Borden; 62x10-6; speed 30 mi; two 300 HP Speedway engs.
Hulls 2755-56, 26-ft tenders for Cox & Stevens.
Hull 2757, runabout, Sidney A. Smith; 60 HP Speedway engs.
Hull 2763, 45-ft cruiser, C. S. Heinz; 180 HP Speedway engs.
Hull 2764, 30-ft cruiser, H. W. Hanan.
Hull 2765, 34-ft play boat, J. F. Brooks; 150 HP Speedway engs.
Hull 2766, 60-ft cruiser, R. C. Reynolds; 180 HP Speedway engs.
Hull 2767, 40-ft cruiser, F. S. Shitton; 180 HP Speedway engs.

COLLINGWOOD SHIPBUILDING COMPANY
Collingwood, Ontario

Royalton, hull 73, bulk freighter, Matthews Steamship Co.; 536-6 LBP; 58 beam; 31 molded depth; 13,000 DWT; 13 mi, loaded speed; 2800 h.p. TE engs; 3 Scotch boilers, 14 10-9; keel Dec31/23; launch Aug24 24, est; deliver Sept 15/24, est.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.
Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.
Trenton, hull 501, scout cruiser, U.S.N.; keel Apr18/20; launched Apr16 23; 99 per cent comp Apr1/24.
Marblehead, hull 502, scout cruiser, U.S.N.; keel Apr4 20; 78.2 per cent comp Apr1 24; launched Oct9 23.
Memphis, hull 503, scout cruiser, U.S.N.; keel Oct4 20; 68 per cent comp Apr1 24.

DEFOE BOAT & MOTOR WORKS
Bay City Mich.

No name, hull 61, yacht, Bubber's account; 98 LBP; 15 beam; 6 draft; 14 speed; Standard gas engine; keel June 28 22; launched Aug 6 23; delivery June1 24, est.
Reomar III, hull 70, R. E. Olds, 100 LBP, 18-6 beam; 4 loaded draft; diesel eng, 250 HP; keel Sept1/23; launched Nov15 23; deliver June 1 24, est.
Two steel car floats, Erie R. R.; 186 long; 34 beam; 8 depth; launch April2 24, est; deliver Apr15 24, est.
No name, hull 76, yacht, Aaron De Roy; 65 LBP; 13-6 beam; 4 loaded draft; 160 IHP gas engs; keel Mar5 24; launch June25 24, est; deliver July15, 24, est.

DRAVO CONTRACTING COMPANY
Pittsburgh, Pa.

Hulls 283-285, inc, 3 steel dump scows, Dravo's account.
Hulls 293-306, inc, 14 steel barges, Mississippi River Commission, Memphis; 430 gross tons each.
Hulls 308-313, inc, 6 steel dump scows, U.S. Engineers, Louisville; 127 tons each.
Hull 317, derrick boat, U.S. Engineers, Huntington, W. Va.; 100 gross tons.
Hull 318, steel hull for sand dredge; Mississippi River Commission, Memphis; 78 gross tons.
Hulls 319-327, inc, 9 steel derrick boat hulls; 115 gross tons each; for U.S. Engineers, Louisville, Ky.
Hulls 328 and 329, 2 dump scows, U. S. Engs., Chicago; 127 gr tons ea.
Hulls 330-331, 2 steel sand and gravel barges, Empire Limestone Co., Buffalo.
Hull 333, steel barge, U.S. Engineers, New Orleans; 120x30x7; 430 tons.
Hull 333, sand digger; Ohio River Sand Co., Louisville; 155x42x7-6; 430 tons.
Hull 334, sand digger, Keystone Sand & Supply Co.; 155x42x7-6; 430 tons.
Hull 335, steel work boat, Second Pool Coal Company.

DUBUQUE BOAT & BOILER WKS.
Dubuque, Iowa

Hulls 70 to 73, inc., oil barges, U.S. Engineers, Rock Island; 100 LBP; 30 beam; 6 loaded draft.
Hulls 75-76, 2 oil barges, U.S. Engineers, Cincinnati; 100 LBP; 30 beam; 6 loaded draft.
Hull 77, hull for towboat, U.S. Engineers, Nashville; 80 LBP; 20 beam; 4-6 loaded draft.

FEDERAL SHIPBUILDING CO.
Kearny, N. J.

Purchasing Agent: R. S. Page.
Hull 78, oil barge, Seaboard Shipping Co.; keel Jan29 24, launched Mar6 24; delivered Mar11 24.
Hull 79, steel oil barge, Mexican Pet. Co.; keel Mar31 24
Hull 80, sister to above.

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent: Chas. Short.
Benson Ford, hull 245, bulk freighter, Ford Motor Co.; 586 LBP; 62 beam; 20 loaded draft 13 mi speed; 13,500 DWT; 3300 HP Doxford engs; keel Nov26 23; launch Apr15 24, est; deliver July1 24, est.
Hull 246, flat scow, M. Sullivan, Detroit; 101 x30x6 ft; launched Mar8 24; delivered Mar20 24.
Hull 247, bulk freighter, H. K. Oakes, Frank-lin S. S. Co., Cleveland; 612 LOA; 586 LBP; 62 beam; 32 depth; 20 loaded draft; 13,500 DW T; 12 mi speed; keel Feb25 24; launch Aug1 24, est; deliver Oct1 24, est.
No name, hull 248, bulk freighter, Columbia S. S. Co., Cleveland; 618 LOA; 592 LBP; 62 beam; 32 depth, 20 draft; 3500 DWT; 12 ; mi speed; keel June15 24, est; deliver Mar1 25, est.

GREAT LAKES ENGINEERING WORKS

Ashtabula, Ohio

Hull [illegible], dump scow, Great Lakes Dredge & Dock Co.; [illegible] LOA [illegible] loaded draft, 1000 [illegible] capacity; keel Mar15 24, launched May1[illegible] 24, est; deliver June [illegible] 24, est.

Hull [illegible], sister to above; keel Mar15 24, launched [illegible] 24, est; deliver June [illegible] 24, est.

HOWARD SHIP YARDS & DOCK COMPANY

Jeffersonville, Ind.

Purchasing Agent: [illegible] H[illegible].

Steel [illegible], 141 [illegible] depth hold.

Two [illegible] boats, U. S. [illegible].

No [illegible], Marine Public Service, Inc., New Orleans [illegible].

No [illegible].

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Pere Marquette 21, hull 209, car ferry, Pere Marquette Ry. Co.; 348 LBP; 56 beam; 16 loaded draft; 14 mi loaded speed; 2 sets TE engs, 27[illegible] total IHP; 4 Scotch boilers, 14x[illegible] 11, 1[illegible] lbs pres; keel Oct[illegible] 23; launched Mar18 24; deliver May 24, est.

Pere Marquette 22, hull 210, sister to above; keel Dec20 [illegible]; launch summer 24.

Hull 211, steel barge, War Dept, U S gov.; 175 ft long, 40 ft molded beam, 11 ft 6 in molded depth; keel Mar28 24.

Hull 212, steel tug, Great Lakes Dredge & Dock Co., Chicago; 75 ft long, 21 ft molded beam; 11 ft molded depth, 300 HP Fairbanks-Morse (O) engs; keel Jan12 24, launch Apr7 24, est.

Hull 213, sister to above, keel Jan19 24; launch Apr7 24, est.

MARIETTA MANUFACTURING CO.

Point Pleasant, W. Va.

Purchasing Agent: S. C. W[illegible].

Sel[illegible], [illegible] steel sternwheel towboat, [illegible] & Laughlin Steel Co.; [illegible] LBP [illegible] beam [illegible] gross tonnage [illegible] ft [illegible] engs, western river [illegible] boilers; keel Oct 1 23, launched Mar28 24.

No name, hull [illegible], steel sternwheel [illegible], 12[illegible] 30x5 2, tandem comp engs, Western river return tubular boiler.

No name, hull [illegible], sister to above.

No name, hull 140 [illegible].

No name, hull 141, [illegible] x13x3.

MIDLAND BARGE COMPANY

Midland, Pa.

Purchasing Agent: H. S. Neal.

Island Queen II, hull 17, [illegible] Island Amusement Co., [illegible] LBP, [illegible] beam, 7[illegible] DWT, [illegible]; delivered Mar24 24.

Hull [illegible], [illegible] U. S. Engineers, Huntington, W. Va.; [illegible] LBP [illegible] DWT; keel [illegible] 23, [illegible]; deliver May [illegible] 24, est.

Hull [illegible], U. S. Engineers, Mobile; [illegible] LBP [illegible] DWT; keel Feb 1 24; launched M[illegible]; deliver May [illegible] est.

Hull [illegible], steel barge, [illegible] Co., New Albany [illegible] LBP [illegible] 400 DWT; keel [illegible] 24 [illegible]; deliver May 1 24, est.

MIDLAND SHIPBUILDING COMPANY, LTD

Midland, Ontario

Purchasing Agent: R. S. M[illegible].

Glen[illegible], hull [illegible], bulk freighter [illegible] LOA [illegible].

NASHVILLE BRIDGE COMPANY

Nashville, Tenn.

Purchasing Agent: Lee E. W[illegible].

Hull [illegible], U. S. [illegible] LBP 26 beam [illegible]; keel M[illegible]; deliver [illegible].

[illegible] W. [illegible] H. [illegible] 110 LBP [illegible]; keel Mar [illegible] 24, est.

Hull [illegible], U. S. Engineers, Cincinnati, 40 LBP [illegible] draft; keels Mar [illegible] 24, est.

Hull [illegible] 120x[illegible]; keel M[illegible].

Hull [illegible] M[illegible].

Hull [illegible] 1[illegible] LBP [illegible]; launched Mar10 24, delivered Mar20 24.

Hull [illegible] LBP [illegible] beam [illegible] June [illegible] 24, est.

Hull [illegible] LBP [illegible].

NAVY YARD

Boston, Mass

[illegible] U. S. N.; 460 LBP; 61 beam; 21 loaded draft; 16 knots loaded speed; 10,600 tons disp; 7000 SHP geared Parsons turbines, 2 WT express type boilers; keel Apr23 21; launched Oct12 23; deliver Aug 1 24, est.

NAVY YARD

Philadelphia, Pa.

Dobbin, hull 7, destroyer tender, U.S.N.; 460 LBP, 60 10 beam, 21 loaded draft; 16 loaded speed, 10[illegible] tons disp; Parsons geared turbine single screw engs, 7000 SHP; 2 WT boilers, keel Dec23 19[illegible]; launched May5 21; deliver July 24, est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: [illegible] Plummer, 233 Broadway, New York City.

George Washington, hull 271, freight and passenger steamer, Old Dominion Steamship Co.; 375 0 LBP, 53 beam, 29 9 depth; speed 16 knots, 21[illegible] DWT; Newport News Curtis turbines, 47[illegible] SHP; B&W boilers; keel Mar10 24.

Robert E. Lee, hull 272, sister to above, keel Mar12 24.

NEW YORK SHIPBUILDING CORP.

Camden, N. J.

Purchasing Agent: J. G. B[illegible].

[illegible], hull 28[illegible], bulk oil steamer, 41[illegible] LBP; 56 beam, 25 [illegible] loaded draft, 10 [illegible] loaded speed, [illegible]870 DWT; 3 cyl TE engs, 3[illegible] SHP, 3 SE Scotch boilers, [illegible] 10x11-4; keel Feb28 23, launched Mar20 24, deliver Apr 24, est.

Hulls 280-289, ten carfloats, Pennsylvania R. R. Co., 250 ft long, 2 tracks, 9 delivered.

Hull 290, self-propelled oil barge for Standard Transp. Co.; 2[illegible] 40x14 [illegible], 2 350 BHP diesel engs, keel Dec18 23, launch Apr8 24, est.

Hull 291, sister to above, keel Dec21 23, launch Apr8 24, est.

Hull 292, sister to above, keel Dec27 23, launch Apr8 24, est.

Hulls 293-4, two carfloats, Harlem Transfer Co., N. Y.; 3 tracks, 27[illegible] long, keels spring; deliver summer, 1924.

Hulls 29[illegible], five carfloats, N. Y. Cent. R. R. Co.; 3 tracks, 3[illegible] long, keels spring; deliver summer 1924.

THE PUSEY AND JONES CO.

Wilmington, Del.

[illegible] steel [illegible], [illegible] Washington [illegible] Washington D. C.; [illegible] LBP [illegible] loaded draft [illegible] speed [illegible] DWT [illegible] engs, 2[illegible] IHP, 4 Scotch boilers; [illegible] keel Mar [illegible] 24, [illegible] deliver Dec [illegible] 24, est.

SPEDDEN SHIPBUILDING CO.

Baltimore, Md.

Purchasing Agent: W. [illegible].

Tug A, hull 25[illegible], U S Engineers [illegible]; [illegible] LBP [illegible] beam [illegible] DWT; 100 HP Marine engs, [illegible] Jan31 24, deliver Mar [illegible] 24, est.

Tug B, hull [illegible], sister to above; [illegible] Jan28 24; deliver April 24, est.

Tug C, hull [illegible], sister to above; [illegible] 24.

Tug D, hull 25[illegible], sister to above; [illegible] Mar[illegible] 24.

STATEN ISLAND SHIPBUILDING COMPANY

Staten Island, N. Y.

Purchasing Agent: R. C. Miller.

No name, hull 749, steel diesel-electric tug boat, Penn. R. R. Co., 10[illegible] LBP, 24 beam, 1[illegible] loaded draft.

No name, hull 750, steel diesel-electric tug boat, Atlantic Refining Co., [illegible]4 LBP, 2[illegible] beam, 11 5 loaded draft.

No name, hull 751, sister to above.

No name, hull 752, sister to above.

SUN SHIPBUILDING COMPANY

Chester, Pa.

Purchasing Agent: H. W. Scott.

A. MacKenzie, hull 5[illegible], hopper dredge, U S Engineers; [illegible] LBP [illegible] beam [illegible] draft [illegible] speed [illegible] DWT [illegible] electric drive; keel Mar [illegible]; launched [illegible]; deliver A[illegible] 24, est.

W. [illegible] M[illegible], hull [illegible], sister to above, keel Mar26 23, launched Nov[illegible] 23, deliver A[illegible] 24, est.

Dan C. Kingman, hull [illegible], sister to above, keel [illegible]; launched Mar22 24.

Wm. [illegible], hull [illegible], sister to above, keel [illegible] M[illegible].

[illegible] LOA [illegible] BHP [illegible]; launched Apr5 24.

[illegible], hull 74, sister to above, keel Dec [illegible]; launched April5 24.

[illegible], hull 7[illegible], sister to above, keel Dec [illegible].

[illegible], hull 7[illegible], sister to above, keel Dec [illegible]; launch Apr19 24, est.

[illegible], hull 7[illegible], sister to above, keel Dec [illegible] 23; launch Apr [illegible] 24.

Hull 7[illegible], oil barge, Sun Oil Co.; keel Jan 1[illegible] 24, launched Mar25 24, delivered Apr5 24.

Hull 79, oil barge, N. Y. Central R. R. Co.; 144 LBP; 27 beam; 11 6 depth; 1100 DWT, keel Jan18/24, launched Mar25 24; delivered Apr3 24.

No name, hull 80, oil barge, Tidewater Oil Co.; 126 ft long, 32 ft beam; 10 ft depth, keel Feb1 24, launched Mar25 24; delivered Apr3 24.

THE TOLEDO SHIPBUILDING CO.

Toledo, Ohio

Purchasing Agent: H. M. Ives.

William K. Field, hull 176, bulk freighter, The Reiss S. S. Co., Sheboygan, Wis.; 580 LBP; 60 beam, 20 loaded draft; 12½ loaded speed; 12,000 DWT; TE eng, 2500 IHP; 3 Scotch boilers, 14 ft; keel June2/23; launched Jan24 24, delivered Mar31 24.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Greenbrier, hull 21, U.S. Lighthouse tender, 164 6 long by 32 6 by 5; 2 non-condensing HP engs, 15-inch diam cylinder, 84-in stroke; 3 Mississippi River type boilers, 26 ft long, coal burning, natural draft; keel June26/23; launched Nov13 23; deliver Apr30/24, est.

C. B. Harris, hull 31, 24-in pipe line dredge, U S Engineers, Cincinnati, O.; 175 long by 50 by 8½, pumping engs, 1000 BHP McIntosh & Seymour diesel, 2 aux 225 BHP McIntosh & Seymour engs; keel Sept20 23; launched Feb21 24, deliver July1 24, est.

Tacoma, hull 32, steel hull, Cincinnati Pomeroy & Charleston Packet Co., Cincinnati, O.; 190 long by 37 by 6; keel Jan17/24; launch April 24, est.

Lookout, hull 33, towboat, U.S. Engineers, Nashville, Tenn.; 116 ft long; 29 ft beam, 5 6 depth, 2 surface condensing tandem comp engs, 500 IHP, 1 watertube boiler, coal burning, natural draft, keel Apr15 24, est.

Repairs

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION

San Pedro, Calif.

Dock, clean, paint, misc: Belridge, E. T. Bedford, Ruth Alexander, Maricopa, Walter Jennings, barge Sampson. Dock, clean, paint: yacht Frontiersman, tug Peacock. Extensive bottom damage repairs: El Cedro. Boiler: Shabonee, Miskianza (also turbine, windlass, pumps and generator), Skagway, Algonquin (also auxiliary and condenser), Cahawan (also deck), Thos. P. Beal (also plate repairs). Tail shaft and stern bearings: Cubbarra. Scale and paint, misc. eng., hull, deck, and aux repairs: La Brea, D. G. Scofield. Piping repairs: La Purisima, Java Arrow (also renew galley stacks, motor windlass), Jacob Luckenbach, Lubrico (also misc. hull, deck, boilers, electrical), San Gerardo, Harvard, [illegible] Mandarin (also propeller), K. R. Kingsbury. Make and install tank: Fort Bragg. Make [illegible] keel plate: Dorothy Alexander. Misc.: Standard, El Alberto, Yale, dredges Monterey, Seattle, Argyle, launch Sea Parrot, yacht Casiana, Hermosa, Ernest H. Meyer, Cabrillo.

MOORE DRYDOCK COMPANY

Oakland, Calif.

Misc. hull, engine and boiler: Tahoher [illegible] Lerch. Dock, clean, paint, misc.: Santa M[illegible], Anna Hanify, Samoa, Tiverton, cutter Bear, Havo, tug Hercules, ferry San Leandro, Ryder Hanify, Martha Buehner, bktn Pactolus, bark Hecla, tug Falcon, Wallingford, West Faralon, Santa Cruz, ferry Eureka, cutter Algonquin, Columbia, West Carmona, m s Nanuk, Star of [illegible] Arrow, ferry Cazadero (not painted). Hull, deck and boiler: [illegible] Ma[illegible]. Propeller repairs: Stockton, Covena. Boiler repairs: Lan[illegible]. Engine repairs: Thordis (also remove and renew winches), Nicomicum, Queen, Ma[illegible] Gargoyle. Drydock, clean, paint: Mount Baker. Renew tailshaft: tug Virgil G. Bogue. Hull repairs: bktn City of Sydney, Point Lobos, barge No. 1, Western Pac. R. R., bktn. St. Katherine.

TODD DRY DOCKS, INC.

Seattle, Wn.

Dock, clean, paint, misc.: Katrina Luckenbach, Curacao, President Jackson, Eldridge, tugs Milwaukee, Snohomish, President Grant. Condenser: Admiral Rogers. Bilge pump: Hakata Maru. Stern tube shaft: Admiral Farragut. Misc.: Admiral Evans, Julia Luckenbach, H. F. Alexander, Iyo Maru, Admiral Watson, Freeport Sulphur No. [illegible], Queen, Tyndareus, Gleniffer, S. [illegible] Dec, Potlatch, Mount Vernon, Kulshan, Shidzuoka, Lake Gere, [illegible] Maru.

YARROWS LTD.

Victoria, B. C.

Dock, clean, paint: Canadian Freighter (also propeller repairs), Romulus (also tail-shaft drawn), Restless (misc.), Lillooet (zincs renewed), Princess Charlotte, Roman Prince (also lined for grain carrying). Docked, new propeller: Heathfield. Docked, repairs: Kuna. Repairs to steering chains: St. Bede.

PERSONAL PARAGRAPHS AND ITEMS OF INTEREST

A NEW freight service between Pacific Coast ports and the United Kingdom and Continent, backed by the powerful Runciman organization of London, and known as the Pacific European Line, has been inaugurated, with Parke Ashburn & Company as general agents on the Pacific Coast. The Pacific European Line offers sailings fortnightly from June to December and on a monthly schedule during the balance of the year. The British steamer Knockfierna, under charter, will start the new service early this month.

Parke Ashburn, head of the general agency, has organized a highly experienced staff and appointed coast ports representatives. Daniel G. Cooke, formerly assistant Pacific Coast manager of the Williams Line, is Pacific Coast traffic manager, with headquarters at 110 California street, San Francisco. Mr. Cooke is widely known in traffic circles, notably in connection with the operations of the French Line and of the Pacific Mail Steamship Company in the Far East.

Vancouver agents are the Canadian American Shipping Company, which is headed by A. Melville Dollar. At Seattle the agents are the Percy S. Laing Shipping Company. Statter & Johnstone, who are relinquishing the Furness Line agency with the opening of the new Furness (Pacific) Line office in Portland, are Columbia River agents for the Pacific European Line.

The regular Pacific Coast ports of call will be Vancouver, Seattle, Portland, and San Francisco; the main United Kingdom and Continental ports will be London, Hull, Leith, Havre, Antwerp, Hamburg, and Rotterdam. Parke Ashburn & Company are connected with the International Chartering Company of New York in the new service. Runciman (London), Ltd., is the London agent; Runciman (Belgium), Ltd., Antwerp agents agents; and Walter Runciman & Company agents at Newcastle-on-Tyne.

MEXICAN SERVICE

Williams, Dimond & Company have been appointed general agents on the Pacific Coast of the United States and Canada for the Mexican Free Ports Commission, the organization which will now control all vessels formerly operated by the Mexican Navigation Company. The steamers of the Mexican Free Ports Commission will be operated in joint service with the Mexican States Line, of which Williams, Dimond & Company are also general agents, serving Vancouver, Seattle, San Francisco, Los Angeles, and ports of the West Coast of Mexico, Gulf of California, and Central America.

VETERAN PILOT DIES

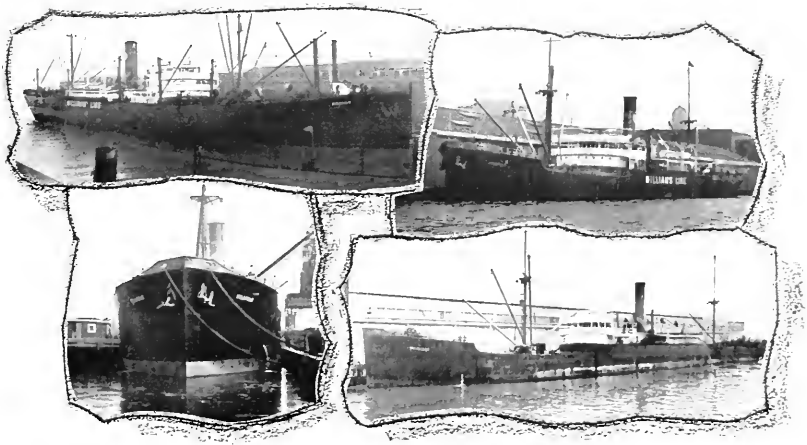
Captain Edward Pentland, for forty years in pilot service on San Francisco Bay, passed away on April 19, at the Marie Hospital. Death followed a long illness. Captain Pentland was one of the best known members of the pilot circle and was a picturesque character, holding great popularity in the marine fraternity.

CROWLEY OFFICIAL ILL

Captain James Sinott, dock superintendent of the Crowley Launch & Tugboat Company, is now at Colfax for an extended rest. Captain Sinott has served the Crowley organization since its organization years ago.

BELGENLAND COMING

The Belgenland, flagship of the Red Star fleet, will visit San Francisco and Los Angeles in December, according to T. H. Larke, Pacific Coast manager of the International Mercantile Marine Company. The Belgenland, on cruise, will come to the coast from New York, via Panama, and will continue from Los Angeles and San Francisco on around the world. The cruise is to cover 133 days. The Belgenland is 670 feet long, with a breadth of 78 feet. She is one of the most palatial passenger carriers on the Atlantic. The dining saloon seats 400 guests.



Steamers Willpolo and Willhilo of the Williams Line's intercoastal service at San Francisco docks

PACIFIC MARINE REVIEW'S
INTERCOASTAL-OFFSHORE-COASTWISE
DIRECTORY
LINES SERVING PACIFIC COAST PORTS

INTERCOASTAL

SAN FRANCISCO

AMERICAN-HAWAIIAN S. S. CO.
215 Market street. Phone Douglas 9560.
FREIGHT ONLY
SAILINGS—Weekly from Seattle, Tacoma, Portland, San Francisco, Oakland, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles, to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents. 230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Kearny 4570.
PASSENGERS AND FREIGHT.
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles, and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between San Francisco, Seattle, Vancouver, B. C., Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents. 230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
201 California street. Phone Sutter 7600.
FREIGHT ONLY.
SAILINGS—North Atlantic - Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles, Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commerce "C" S. S. Lines.)
Swayne & Hoyt, Inc., Pacific Coast agents. 430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Intercoastal.
By five steamers between New York, Philadelphia, Wilmington, Norfolk, Baltimore and Los Angeles, San Francisco, Portland and Seattle.

MUNSON-McCORMICK LINE
McCormick Steamship Co., Pacific Coast agts. 215 Market street. Phone Kearny 3100.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

PACIFIC EUROPEAN LINE
Parke Ashburn & Co., Pac. Coast agents. 310 California street. Phone Douglas 1670.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco and United Kingdom and Continental Europe

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3800.
SAILINGS—Intercoastal (Passengers and Freight).
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Manzanillo, Los Angeles, San Francisco.
SAILINGS—Intercoastal (Direct Freight Service).
Every 7 days. Eastward calls: San Francisco, Los Angeles, Philadelphia, New York and Norfolk. Westward calls: New York, Baltimore, Norfolk, Los Angeles, San Francisco.

PACIFIC-CARRIBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Offices: 550 Market street. Phone Douglas 8680.
Freight and Operating Offices: Pacific Steamship Co., 460 California st. Phone Sutter 7400.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
W. D. Benson, Pac. Coast Mgr.,
311 California street. Phone Garfield 2700.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Puget Sound.

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, agents.
240 California street. Phone Garfield 2846.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
A. F. Zirl, Pacific Coast manager.
110 California street. Phone Douglas 1670.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 14 days between Seattle, Tacoma, San Francisco, Oakland, Los Angeles and New York, Philadelphia, Norfolk and Baltimore.

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Dearborn, agent.
Mutual Life Building.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents. Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Every 10 days between Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

INSPECTS COAST PORTS

Joseph Scott, general manager of the Transmarine Line, operating between Port Newark and Pacific Coast ports, recently completed an extensive tour of coast harbors. He was accompanied on the trip by W. D. Benson, Pacific Coast manager of the line. Mr. Scott announced that the Transmarine Corporation had applied to the Los Angeles Harbor Commission for allocation of suitable terminal facilities at that port. Mr. Scott is returning to his New York headquarters from the Puget Sound territory. En route to the coast he inspected the "T" Line terminals at Pensacola, Beaumont and Port Arthur.

Y. K. K. AT VANCOUVER, B. C.

Yamashita Kisen Kaisha announces the opening of its own offices at Vancouver. Frank Rosene, formerly with the Y. K. K. in Seattle and later with its representatives, Sanderson, Kernahan, Ltd., of Vancouver, has been appointed manager. It is planned to have monthly sailings out of Vancouver.

NEW TRAFFIC HEAD

J. M. Sims, vice-president and general manager of the Outer Harbor Dock & Wharf Company, Los Angeles, announces that F. J. McGowen has been appointed traffic manager for the firm at San Pedro, succeeding J. E. Marshall, who has resigned.

R. C. A.'S 1923 REPORT

Great strides made by radio in the past twelve months and its rise to a leading national industry are reflected in the annual report of the Radio Corporation of America for 1923. The report shows a total of $26,394,789 in gross income for 1923, as against $14,830,856 for 1922. Its net income from 1923 is given as $4,737,774, as compared with $2,974,579 for 1922 and $126,799 for 1921. The marine department is very interesting. The Radio Corporation operates marine coastal stations which communicate with ships at sea. These

INTERCOASTAL

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, agent.
420 L. C. Smith Building. Phone Elliott 0974.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Los Angeles, San Francisco, Vancouver New York, Boston, Baltimore, Philadelphia, Norfolk and Port Land, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
L. C. Smith Building. Phone Elliott 1206.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland, Los Angeles, Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commercial S. S. Lines.)
Swayne & Hoyt, agents.
Central Building. Phone Elliott 6383.
FREIGHT ONLY.
SAILINGS—Intercoastal.
By 7 steamers between New York, Philadelphia, Wilmington, Norfolk, Baltimore, and Los Angeles, San Francisco, Portland and Seattle.

MUNSON-McCORMICK LINE
Pier 6. Phone Elliott 5367.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco, Portland, Tacoma and Seattle.

PACIFIC EUROPEAN LINE
Pier 5, Lighter Shipping Co., agents.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco and United Kingdom and Continental Europe.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt.
Central Building. Phone Elliott 6383.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Office, 609 Second avenue.
Pacific Steamship Company, agents.
L. C. Smith Building. Phone Elliott 2068.
SAILINGS—Intercoastal.
Regular intervals between New York, San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
Transmarine Corporation.
1421 White Building. Phone Elliott 6125.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco, Portland and Puget Sound.

UNITED-AMERICAN LINES, INC.
Sudden & Christensen, agents.
Yesler Club Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Philadelphia and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
Seaboard Building. Phone Elliott 6637.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 14 days between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, and New York, Philadelphia, Norfolk and Baltimore.

LOS ANGELES

AMERICAN-HAWAIIAN S. S. CO.
W. S. Mellroom, agent.
Central Building. Phone 821 [illegible].
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco and Los Angeles to Corpus [illegible].

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Van Nuys Building. Phone Maine 873044.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks from Vancouver, Seattle, Portland, San Francisco and Los Angeles to New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
212 Mortgage Guarantee Building, 108 So. Spring St. Phone 574-[illegible].
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Sailings between Los Angeles, San Francisco, Seattle, Vancouver, B. C., New York, Boston, Baltimore, Philadelphia, Norfolk and Port Land, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Building. Phone 873044.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company.
208 West Eighth street. Phone Main 808.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 14 days from Portland, San Francisco and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commercial S. S. Lines.)
Swayne & Hoyt, Inc., agents.
488 Pacific Electric Bldg. Phone 824 659.
FREIGHT ONLY.
SAILINGS—Intercoastal.
by five steamers between New York, Philadelphia, Wilmington, Baltimore, Norfolk and Los Angeles, San Francisco, Portland and Seattle.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
Lane Mortgage Bldg. Phone Metropolitan 6140
FREIGHT ONLY.
SAILING—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

PACIFIC MAIL STEAMSHIP CO.
Passenger Offices, 173 South Spring street.
Freight Office, 165 West Sixth street.
SAILINGS—Intercoastal (PASSENGERS AND FREIGHT).
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Baltimore, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Los Angeles and San Francisco.
SAILINGS—Intercoastal (DIRECT FREIGHT SERVICE).
Every 7 days Eastward calls: San Francisco, Los Angeles, Baltimore, New York and Norfolk. Westbound sails: New York, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., agents.
488 Pacific Electric Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA-PACIFIC LINE
International Mercantile Marine Company.
Freight Offices, Pacific Steamship Company, 322 Citizens National Bank.
Passenger Offices, 510 So. Spring st. Phone 872-311.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
(Transmarine Corporation)
G. T. Darrach, agent.
A. G. Bartlett Bldg. Phone [illegible].
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles and San Francisco [illegible].

stations are now located at Chatham, Massachusetts; New York City; Cape May, New Jersey; San Francisco, and Los Angeles.

"Our radio service between ships and shore has undergone considerable change during the year," says the report. "Improved types of apparatus have enabled us to permanently close our coastal stations at New London, Connecticut, and Siasconset, Massachusetts. The service formerly rendered by them is now performed with greater efficiency by the Chatham station. The closing of the stations mentioned is pursuant to our policy of eliminating interference with radio broadcast programs, caused by marine spark transmitting apparatus, by using only continuous wave tube transmitters in shore to ship service." The Radio Corporation is now serving 759 ships on a rental and service basis. The gross income for rentals, sales, service fees, and ship tolls on message traffic during 1923 from the marine division, was $738,140.

FALK AGENTS

The Falk Corporation of Milwaukee announces the appointment of representatives in San Francisco and Detroit to handle Falk herringbone gears and Falk-Bibby couplings. E. C. Myers is appointed to the San Francisco office with headquarters at 320 Rialto building. Mr. Myers is a graduate of Syracuse University, where he took the four-year electrical engineering course. For several years he was with the General Electric Company, first at Schenectady and for about ten years in San Francisco. A little more than a year ago he opened a New York office for Catton, Neill & Company, Ltd., and now joins the Falk Corporation after having had an experience that should make him a valuable member of the sales staff of that concern. His territory includes the states of California, Oregon, and Washington. Charles C. Walsh is to head the Detroit branch. Mr. Walsh also has had wide engineering and selling experience and is thoroughly acquainted with the field.

TODD BUSY

The Todd Shipbuilding & Drydock Corporation, Tacoma, Washington, launched the first two of the six 120-foot steel coal barges for the United States Engineers, Portland, on April 18 and 19.

JOB ON MONTAGUE

Crowley Shipyards, Oakland, was awarded contract for reconditioning

UNITED AMERICAN LINES, INC.

PACIFIC COAST HEADQUARTERS, 230 CALIFORNIA STREET, SAN FRANCISCO

S. S. Mount Clinton—One of the Express Intercoastal Freighters

INTERCOASTAL
WEEKLY SERVICE
VIA PANAMA CANAL
Baltimore-New York
Savannah and Los Angeles
San Francisco-Seattle-Portland

NORTH PACIFIC-EUROPEAN
FORTNIGHTLY SERVICE
PASSENGERS and FREIGHT
Between North Pacific Ports
and
United Kingdom-Continent

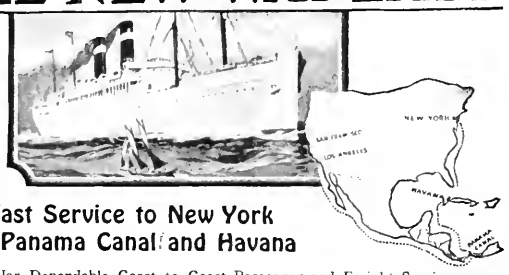
PACIFIC COAST AGENTS

LOS ANGELES S. S. COMPANY, Los Angeles
SUDDEN & CHRISTENSON, San Francisco and Puget Sound
COLUMBIA PACIFIC SHIPPING CO., Portland

ATLANTIC COAST AGENTS

UNITED AMERICAN LINES, INC.

THE NEW WAY EAST



Fast Service to New York
via Panama Canal and Havana

Regular Dependable Coast to Coast Passenger and Freight Service
New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle, Tacoma

WESTBOUND	From New York, Pier 61, N. River	EASTBOUND	From San Francisco, Pier 22—Los Angeles Har.	
FINLAND	May 15	MANCHURIA	May 10	May 12
MANCHURIA	June 5	KROONLAND	May 24	May 26
KROONLAND	June 19	FINLAND	June 7	June 9
FINLAND	July 3	MANCHURIA	June 28	June 30
MANCHURIA	July 31	KROONLAND	July 12	July 14
KROONLAND	Aug. 14	FINLAND	July 26	July 28

Direct connections at New York and thru Bills of lading issued via: American Line to HAMBURG. Red Star Line to ANTWERP. Atlantic Transport Line to LONDON. White Star Line to LIVERPOOL, SOUTHAMPTON and MANCHESTER

PANAMA PACIFIC LINE

INTERNATIONAL MERCANTILE MARINE COMPANY

Passenger Offices:
T. H. LARKE—Pacific Coast Manager

SEATTLE, 619 Second Ave.
SAN FRANCISCO, 550 Market St.
LOS ANGELES, 510 South Spring St.

PACIFIC STEAMSHIP CO. (The Admiral Line), General Freight Agents Pacific Coast

SAN FRANCISCO, 60 California St.
LOS ANGELES, 322 Citizens National Bank
SEATTLE, L. C. Smith Bldg.
PORTLAND, Admiral Line Terminal

INTERCOASTAL

UNITED AMERICAN LINES, INC.
Los Angeles Steamship Company, agents.
306 Central Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company.
Stock Exchange Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 14 days between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, and New York, Philadelphia, Norfolk and Baltimore.

PORTLAND

AMERICAN-HAWAIIAN S. S. CO.
C. D. Kennedy, agent.
Railway Exchange Building.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
400 Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Portland, York, Boston, Providence, Philadelphia and Baltimore.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
Spalding Building. Phone Broadway 4378
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 14 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Cosmopolitan S.S. Lines)
Swayne & Hoyt, Inc., agents.
Spalding Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
By five steamers between New York, Philadelphia, Wilmington, Baltimore, Norfolk and Los Angeles, San Francisco, Portland and Seattle.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
181 Burnside street. Phone Broadway 1498.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland and Seattle.

PACIFIC EUROPEAN LINE
Sinnott & Johnston, agents.
FREIGHT ONLY.
SAILINGS—Monthly, between Vancouver, Seattle, Portland, San Francisco and United Kingdom & Continental Europe.

PACIFIC MAIL STEAMSHIP CO.
Norton, Lilly & Co., agents.
Yeon Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days. Eastward calls: San Francisco, Los Angeles, Baltimore, New York and Norfolk. Westbound calles New York, Baltimore, Norfolk, Los Angeles, San Francisco.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., agents.
Spalding Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Pacific Steamship Company, freight agents.
Admiral Line Terminal.
SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
(Transmarine Corporation)
Geo. Lovell, agent.
Wilcox Building
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Puget Sound.

UNITED AMERICAN LINES, INC.
Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

VANCOUVER

ARGONAUT STEAMSHIP LINE
B. W. Greer & Son, Ltd.
602 Hastings street, West.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Kools, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Every [illegible] Vancouver to Montreal [illegible] from other Pacific Coast port

DOLLAR STEAMSHIP LINE
Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Vancouver, B. C., Seattle, San Francisco, Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

ISTHMIAN STEAMSHIP LINES
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles

LUCKENBACH LINES
Empire Shipping Company, Ltd.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf
Every 14 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
Canadian American Shipping Company, Ltd.
Phone Seymour 2198.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 3 weeks from North Pacific Coast ports San Francisco, Los Angeles, to New York Philadelphia, Wilmington, Baltimore and Norfolk.

MUNSON-McCORMICK LINE
King-Ley Navigation Company, Ltd.
602 Pacific Building. Phone Seymour 9506.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco and North Pacific Coast ports.

PACIFIC EUROPEAN LINE
[illegible] Shipping Co.
FREIGHT ONLY.
SAILINGS—Monthly [illegible] Seattle, Portland, San [illegible] Kingdom & Continental

PACIFIC-CARIBBEAN GULF LINE
[illegible] Co., Ltd.
413 Pacific Building.
FREIGHT ONLY.
SAILINGS—Monthly from North Pacific ports San Francisco, Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports.

the Shipping Board freighter Montague for spot service. The bid submitted by the Crowley company was $16,586.

WORK BOAT LINE

San Juan Tugboat Company was recently organized at Seattle to operate in the general towing business on Puget Sound. Captain William P. Thornton is manager.

SCRAP OLD TIMER

The famous old cableship Burnside, lying idle at Lake Union, Seattle, has been sold to the General Metals Supply Company of Oakland, California, and will be taken to the latter city for scrapping. The Burnside was formerly the Spanish ship Rita and was captured during the war with Spain in 1898.

CARY-DAVIS EXPANDS

Cary-Davis Tug & Barge Company, Seattle, long established in the general towing business on Puget Sound, has taken over the agency in Washington, Oregon and Alaska of the Merritt, Chapman & Scott Corporation. This company has also taken over the operation of the tugs Sea Monarch and Storm King, owned by the Shipowners & Merchants Tugboat Company of San Francisco, and will operate them independently of the owners.

WESTERN AGENCY

Bayside Steamship Company has been appointed agent for the Western Whaling & Trading Company of San Francisco. The Western corporation operates the motorship Carolyn Frances and will dispatch her from San Francisco May 5, and Seattle May 15, for Bethel and other Alaskan points.

NEWCASTLE CALM

The two-year controversy between the United States and Great Britain over the closing of the American consulate at Newcastle has at last been settled. The post will be reopened shortly, it was announced by the State Department. The British government withdrew charges that the American consuls there had exceeded their authority and agreed to their reassignment to posts in the British Empire. The Newcastle consulate was closed in May, 1922, when the British government withdrew recognition of Consuls Slater and Brooks on the grounds that they had exceeded their authority in influencing British travelers to patronize American ships.

ORIENTAL

SAN FRANCISCO

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

Dodwell & Company.
2 Pine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.
SAILINGS—India Service.
Once every 4 or 5 months from Vancouver to usual ports, Bombay and Calcutta.

DOLLAR STEAMSHIP LINE

The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Kearny 4570.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings between San Francisco, Seattle, Vancouver, Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles.

GARLAND STEAMSHIP CORP.

FREIGHT ONLY.
244 California street. Garfield 4700.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from San Francisco and Portland direct to Shanghai and Manila.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
Merchants' Exchange Bldg. Phone Sutter 3414.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NIPPON YUSEN KAISHA

Dodwell & Company, Ltd.
2 Pine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Regular service between China, Japan ports and United States Atlantic ports via Panama Canal, vessels calling at San Francisco on both outward and homeward voyages. One arrival monthly from Japan, discharging cargo at San Francisco. One, two sailings monthly homeward, occasionally loading cargo for Yokohama, Kobe and Shanghai.

OSAKA SHOSEN KAISHA

McCormick, McPherson & Lanham.
503 Market street. Phone Kearny 3632
SAILINGS—San Francisco Service (FREIGHT ONLY).
Monthly service to and from Yokohama, Kobe, Moji, Shanghai, Hongkong and Singapore.
SAILINGS—Los Angeles Service (PASSENGERS AND FREIGHT).
A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, the Panama Canal and Los Angeles.

PACIFIC MAIL STEAMSHIP CO.

508 California street. Phone Sutter 3800.
(Operating U. S. S. B. vessels.)
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific Service.
Every 14 days from San Francisco to Honolulu, Yokohama, Kobe, Shanghai, Manila and Singapore. Moji, Hongkong-India (Freight Only.)
SAILINGS—Hongkong-India (Freight Only.)
Connection at Hongkong every 2 weeks for India ports.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels.)
155 Montgomery street. Phone Sutter 7640.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular monthly sailings from Los Angeles, San Francisco, Portland, Seattle to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Moji, Hongkong-India. Direct Take Up at Suez.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
540-51 Market street. Phone Sutter 3600.
PASSENGERS AND FREIGHT
SAILINGS—Trans-Pacific.
Twice monthly sailings on Thursday between San Francisco, Honolulu, Yokohama, Kobe, Nagasaki, Shanghai and Hongkong.
SAILINGS—Monthly sailings from China and Japan on steamers from the West Coast of Mexico and South American ports to Los Angeles.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
333 Robert Dollar Bldg. Phone Garfield 3899
FREIGHT ONLY.
SAILINGS—Semi monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

SEATTLE

ADMIRAL ORIENTAL LINE

L. C. Smith Building. Phone Elliott 2068.
SAILINGS—PASSENGERS AND FREIGHT.
Every 12 days between Seattle, Victoria, B. C., Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—FREIGHT ONLY.
Regular service to Vladivostok, Dairen, Tientsin, Tabu Bar, Tsingtao, Shanghai and Japan ports on either outward or homeward voyages, as freight offers justify direct call.
SAILINGS—Monthly service to Yokohama, Kobe, Shanghai, Foochow, Amoy, Swatow, Manila, Cebu and Iloilo.

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Stuart Building. Phone Elliott 1747
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong and Manila.

DOLLAR STEAMSHIP LINE

Admiral Oriental Line, agents.
L. C. Smith Building. Phone Elliott 0794.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular sailings North Pacific Coast ports to Shanghai, Kobe, Hongkong and Manila, returning via Los Angeles and San Francisco.

R. T. JOHNS & COMPANY

R. T. Johns & Company, agents.
Central Building. Phone Elliott 3497.
FREIGHT ONLY.
SAILINGS—Regular service between Seattle and Oriental ports of Yokohama, Kobe, Nagova, Shimidzu and Moji.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
Arcade Block Building. Phone Elliott 1450.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco, Portland, Seattle and Puget Sound ports, thence to China and Japan.

NIPPON YUSEN KAISHA

Colman Building. Phone Elliott 3814.
PASSENGERS AND FREIGHT.
SAILINGS—Frequent intervals, calling at Victoria or Vancouver, B. C. Yokomama, Kobe, Moji, Nagasaki, Shanghai, Hongkong or other Oriental ports as inducements offer.

OSAKA SHOSEN KAISHA

W. C. Dawson & Company, agents.
Mutual Life Building. Phone Elliott 1642.
PASSENGERS AND FREIGHT.
SAILINGS—Regular fortnightly service to Yokohama, Kobe, Moji, Dairen, Shanghai, Moji.

SUZUKI & COMPANY

Colman Building. Phone Elliott 2[illegible].
FREIGHT ONLY.
SAILINGS—Irregular service between Seattle and [illegible] ports.

THORNDYKE-TRENHOLME CO.

L. C. Smith Building. Phone Main 3[illegible].
FREIGHT ONLY.
SAILINGS—Regular service to Japan ports. Seattle to Yokohama, Kobe, Moji and Nagova.

WALKER-ROSS, INC.

L. C. Smith Building. Phone [illegible].
FREIGHT ONLY.
SAILINGS—Regular service to Japan ports. Seattle to Yokohama, Kobe, Moji and Nagova.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
Colman Building. Phone [illegible].
FREIGHT ONLY
SAILINGS—Every 2 weeks from Seattle to Yokohama, Kobe, Osaka and Nagoya.

LOS ANGELES

CANADIAN GOVERNMENT MERCHANT MARINE

Dodwell & Company.
412 West Sixth street. Phone [illegible].
FREIGHT ONLY
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports returning via Los Angeles and San Francisco.
SAILINGS—India Service.
Once every 4 or 5 months from Vancouver to usual ports, Bombay and Calcutta.

AGAIN "LOCK SUM"

The American steamer Commercial Scout, now at Seattle undergoing survey and overhauling, is soon to be turned over to her new owners, Carmichael & Clarke, of Hongkong, and will be renamed Lock Sum, under which name the vessel was originally operated in Chinese waters. Captain Jock Hill, well-known Pacific navigator, is in Seattle taking charge of the vessel, relieving Captain J. H. Whitehorn. The vessel is to proceed from Seattle to Columbia River points to load for Hongkong.

ENGINEERS IN JUNE

Preparations are well under way for the tenth annual convention of the American Association of Engineers to be held in San Francisco June 11 to 14, inclusive. It is predicted that this meeting will be the largest in the history of the national organization. Delegtes from all parts of the United States and its possessions, accompanied by their families and friends, interested in the work of the association, will attend. William H. Phelps, division engineer of the Southern Pacific east bay electric lines, past president of the San Francisco chapter, has been selected as chairman of the transportation committee. Damian L. Reynolds, engineer with the car department of the Pacific Fruit Express Company, will be in charge of the committee on public information. Chairmen of other committees are: Charles H. Lee, finance; W. W. Brier, accommodations, and Thomas H. Means, entertainment.

PIRATE PASSES

Back in 1902 she steamed down the Weser, the finest thing afloat on the Atlantic and the pride of Norddeutscher Lloyd's passenger fleet; in the two years that followed August, 1914, she became the terror of merchantmen in the South Atlantic, a commerce destroyer, and now she is in Pacific Coast waters, en route to the Bering Sea, to become a tender for salmon canneries.

She is the Otsego, and recently called at Los Angeles and San Francisco, laden with tin and steel from Atlantic ports. She looked like any other tramp, though her rakish lines hinted of speed. Once the famous Prinz Eitel Friedrich—but now a black cargo carrier.

Excitement of war forced her into oblivion after that day in 1916 when she limped into Newport News, her crew and 100 British prisoners of

ORIENTAL

DOLLAR STEAMSHIP LINE
212 Mortgage Guarantee Bldg. Phone 874-891.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings between Los Angeles, San Francisco, Seattle, Vancouver, Yokohama, Kobe, Shanghai, Hongkong, and Manila.

OSAKA SHOSEN KAISHA
McCormick, McPherson & Lapham.
Central Building.
PASSENGERS AND FREIGHT.
SAILINGS—A steamer a month to Yobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, Panama Canal and Los Angeles.

STRUTHERS & BARRY
(Operating U. S. S. B. vessels.)
710 Pacific Electric Bldg. Phone Tucker 5969.
FREIGHT ONLY.
SAILINGS—Regular intervals from Los Angeles and San Francisco, thence to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Darien, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA
(Oriental Steamship Company.)
S. L. Kreider, agent.
375 Pacific Electric Bldg. Phone 876-536.
PASSENGERS AND FREIGHT.
SAILINGS—Every second Thursday to China and Japan via San Francisco on steamers of Japan, Hongkong, San Francisco line.
SAILINGS—Monthly to Oriental ports via San Francisco and Los Angeles on steamers from West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

PORTLAND

GARLAND STEAMSHIP CORP.
General Steamship Corp., agents.
212 Porter Bldg. Phone Broadway 6714.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from San Francisco and Portland direct to Shanghai and Manila.

MITSUI & COMPANY LTD.
(Mitsui Bussan Kaisha, Ltd.)
702 Wilcox Building. Phone Main 4113.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NORTH CHINA LINE
(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Tsingtao Bar and Dairen.

TOYO KISEN KAISHA
(Oriental Steamship Company.)
Oregon Pacific Company, agents.
203-4 Wilcox Building. Phone Bdwy. 4529
FREIGHT ONLY.
SAILINGS—Monthly from Portland to Oriental ports.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental New York via Panama Canal.

SOUTH CHINA LINE
(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Broadway 5360.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Portland to Yokohama, Kobe, Hongkong and Manila.

YAMASHITA KISEN KOGYO KAISHA
Yamashita Company.
1109 Porter Building.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., agents.
Yorkshire Building. Phone Seymour 467.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.
SAILINGS—India Service.
Once every 4 or 5 months from Vancouver to usual ports, Bombay and Calcutta.

CANADIAN PACIFIC STEAMSHIPS, LTD.
Canadian Pacific Railway Station. Phone Seymour 2630.
PASSENGERS AND FREIGHT.
SAILINGS—Every 14 days from Vancouver to Japanese ports, Shanghai and Hongkong.

DOLAR STEAMSHIP LINE
Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings from North Pacific ports to Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles and San Francisco.

NIPPON YUSEN KAISHA
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Vancouver and ports in Japan, China and Philippines.

OSAKA SHOSEN KAISHA
Empire Shipping Company, Ltd.
815 Hastings St., W. Phone Seymour 8084.
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks to all ports in Japan and China, also Vladivostok, Singapore, Bombay, etc.

SUZUKI & COMPANY
B. L. Johnson Walton & Company.
850 Hastings street, West. Phone Seymour 8198.
FREIGHT ONLY.
SAILINGS—Irregular service between Pacific Coast ports and Japan ports.

WALKER-ROSS, INC.
Canadian American Shipping Company, Ltd.
Phone Seymour 2198.
FREIGHT ONLY.
SAILINGS—Regular service to Yokohama, Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO KAISHA
Sandeman, Kerr and [illegible] Ltd.
FREIGHT ONLY.
SAILINGS—Every 2 weeks to Yokohama Kobe, Osaka and Nagoya.

UNITED KINGDOM---CONTINENTAL EUROPE

SAN FRANCISCO

BLUE FUNNEL LINE
Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.
2 Pine street. Phone Sutter 4201.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpol and Glasgow.

EAST ASIATIC COMPANY, LTD.
The East Asiatic Company, Inc., agents.
433 California street. Phone Sutter 6717.
PASSENGERS AND FREIGHT.
SAILINGS—[illegible] ports, direct to Hamburg, Hamburg, Bremen, Antwerp, Rotterdam, with transshipment all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE, LTD.
Norton, Lilly & Company, general agents.
485 California street. Phone Sutter 3[illegible]
FREIGHT ONLY.
SAILINGS—Service between Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports, via Hull.

war ill after having been chased for three months about the West Indies by a squadron of British cruisers.

She was interned and after America entered the war was seized and put to work as a Yankee troopship. For three years until recently she has been lying in one of the Board's mud-flats. Two months ago Libby, McNeil & Libby bought her and ordered her into service to replace their fleet of four old square-riggers in the Arctic. It is to the credit of A. H. Wake, chief engineer, that she was conditioned in twelve days and brought around to the coast at twelve knots.

Now the Otsego is en route for the mouths of the Nushagak and Naknek rivers, the entrance to the Valley of Ten Thousand Smokes, under the Arctic Circle. On the way up the old-timer picked up 800 cannery workers, and when the ice drives her south in the winter time she'll bring out her harvest of salmon.

ABOUT BOOKS

Milton J. Ferguson, California state librarian, is setting up a good example for every Yankee sea-coast realm. Librarians throughout the state devoted a week recently to collecting books for distribution among seamen on ships serving California ports. "Seamen enjoy snappy fiction," said Ferguson, "tales of action and adventure, volumes of history and travel, biography and popular science. It is certain that thousands of such books in homes will gladly be given for the seamen." It is asked that the books be left at any public library or county library.

SO LONG, SMOKE!

The electrically operated "smoke periscope," a device perfected by the Shipping Board's committee on food conservation, has been officially adopted and installed on the steamer Schodak, according to reports from New York.

With the aid of this device, details of which have not yet been made public, men on watch in the fireroom of a vessel can tell at a glance if they are getting proper combustion from the fuel used and see that much of the valuable oil is not going up the funnel in smoke form—declared to be wasted fuel energy.

Careful check will be made of the efficiency of the "smoke periscope" as installed on the Schodak and if it proves successful in actual operation it will probably be installed on all Board ships. The cost is nominal, according to reports.

UNITED KINGDOM---CONTINENTAL EUROPE

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation, managents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
710 Balfour Building. Phone Sutter 6478-6479.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports when inducements offer.

GENERAL STEAMSHIP CORP.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
351 California street. Phone Sutter 6437.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailing fortnightly.

ISTHMIAN STEAMSHIP LINES
E. C. Evans & Sons, agents.
260 California street. Phone Douglas 8040-1-2.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
W. R. Grace & Co., general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Havre, Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Royal Mail Steam Packet Company and Holland America Line.)
401 Market street. Phone Douglas 7510.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Amsterdam, Hamburg.

NORWAY-PACIFIC LINE
485 California street. Phone Sutter 5099.
FREIGHT ONLY.
SAILINGS—From San Francisco and Los Angeles to United Kingdom, Continental ports and Norwegian ports every 30 days.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
485 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES
Sudden & Christenson, agents.
230 California street. Phone Garfield 284n
For passengers. Phone Sutter 40.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SEATTLE

BLUE FUNNEL LINE
Dodwell & Company, Ltd., agents.
Smith Building. Phone Elliott 9147.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.
The East Asiatic Company, Inc., agents.
823 Alaska Building. Phone Elliott 2945.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service from Pacific Coast ports at Hawaii to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Service between Pacific Coast ports, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation.
Colman Building. Phone Elliott 5706.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness, Withy & Company, Ltd.)
Furness (Pacific), Ltd.
705 Arctic Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
Colman Building. Phone Elliott 5706.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company, agents.
Stuart Building. Phone Elliott 1464.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings every 2 weeks.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
W. R. Grace & Company.
Hoge Building. Phone Elliott 3412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Havre, Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Royal Mail Steam Packet Company and Holland America Line.)
204-206 Rainier Building. Phone Elliott 4944.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Amsterdam, Hamburg.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
FREIGHT ONLY.
SAILINGS—Sees & from Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES
Sudden & Christenson, agents.
Arctic Club Building.
PASSENGERS AND FREIGHT.
SAILINGS—North-Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

LOS ANGELES

BLUE FUNNEL LINE
(Ocean Steamship Company, agents.) Mutual
Dodwell & Company, Ltd.
412 Union Oil Building.
Phone Main 4944.
FREIGHT ONLY.
SAILINGS—Every 6 weeks from North Pacific Coast ports, including San Francisco and Los Angeles, to Liverpool and Glasgow via Panama Canal.

EAST ASIATIC COMPANY, LTD.
Pacific Coast Agents, Inc.
[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—Regular service from Pacific Coast ports [illegible] Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

The job of reconditioning the President Pierce was completed and trials were held on April 8. New boilers were installed which enabled the vessel to show improvement in her speed, over 19 knots being obtained on natural draft.

* * *

TRADE NOTES

According to an amendment to the Independent Offices Bill, passed by the Senate in April, navy yards will have the opportunity of bidding on all repairs to Shipping Board vessels where the out-of-pocket cost of work will be in excess of $100,000 without consideration of overhead. This means that the navy yards will have the privilege of competing with privately-owned yards and will base their bids on a cost-plus basis. The bill is awaiting the signature of the President.

* * *

The Brunswick-Kroeschell Company has the contract for installation of two 6-ton refrigerating machines in the new Southern Pacific liner being built at the Todd plant, Tacoma.

* * *

Plant and equipment of the Pacific Construction & Engineering Company, Seattle, were recently purchased by the Isaacson Company Iron Works, Seattle, for approximately $100,000. The Isaacson Company specializes in the manufacture of ship anchors and tools for the California oil industry.

* * *

The Western Boat Building Company, Tacoma, Washington, will rebuild the motor freighter Rubaiyat, which is being salvaged from the waters of Puget Sound.

* * *

The Marine Construction Company, Seattle, was low bidder for the construction of a 48-foot diesel tug for the Army Engineers, Portland, Oregon. Their bid was $6944. Other bids submitted were from Ericksen & Kiepp, Rainier, $9164; N. J. Blanchard Boat Company, Seattle, $10,643; and the St. Helens Shipbuilding Company, $11,700.

* * *

King & Winge Shipbuilding Company, Seattle, has just completed a job on the codfish schooner Maid of Orleans, conditioning her for the Alaska trade. An engine for auxiliary power was installed and the wooden hull was sheathed in iron bark as a protection against ice floes of the Arctic Ocean.

UNITED KINGDOM---CONTINENTAL EUROPE

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Van Nuys Building. Phone 873044.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
S. L. Kreider, agent.
Pacific Electric Bldg. Phone Pico 6680; Bdy. 23.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness Withy & Company, Ltd.)
Swayne & Hoyt, Inc., agent.
488 Pacific Electric Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco, Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
S. L. Kreider, agent.
Pacific Electric Bldg. Phone Pico 6680 Bdy. 23.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
315 Union Oil Building. Phone 7865
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Building. Phone 873044.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service.
Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego, to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
H. R. & M. F. McLaurin, Inc.
406 South Main street. Phone Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Pacific Coast ports to Swedish and Norwegian ports, also Helsingfors, Finland, Calais and Hamburg.

NORTH PACIFIC COAST LINE
(Joint service of the Blaine-Ameroea Line and Royal Mail Steam Packet Co.)
C. J. Lehman, agent.
121 E. Sixth street. Phone Trinity 5171.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Seattle, Portland, Astoria, San Francisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

NORWAY PACIFIC LINE
703 Pallos Verdes street, San Pedro.
FREIGHT ONLY.
SAILINGS—Four motorships operating from San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia. Sailings every 30 days.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
Van Nuys Building. Phone 873044
FREIGHT ONLY.
SAILINGS—Service from Vancouver, Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES
Los Angeles S. S. Company, agents.
806 Central Building.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service.
Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

PORTLAND

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.)
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles and London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.
Chalmers & Cartwright, Ltd., agents.
Porter Building. Phone Broadway 4132
PASSENGERS AND FREIGHT.
SAILINGS—Regular services, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique)
(General Steamship Corporation)
Porter Building. Phone 6714.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
506 Sedwick Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
Porter Building. Phone Broadway 4571
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
358 Oak street. Phone Bdwy. 2161.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service.
Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego, to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
Lidell & Clarke, agents.
305 Yeon street.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Pacific Coast ports to Scandinavia.

NORTH PACIFIC COAST LINE
(Joint service of the Blaine-Ameroea Line and Royal Mail Steam Packet Co.)
Oregon-Pacific Company, agents.
203 Wilcox Building. Phone Broadway 4132
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Seattle, Portland, Astoria, San Francisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—From Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES
Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Broadway 4571
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service.
Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

VANCOUVER

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., agents.
Yorkshire Building. Seymour 9576.
PASSENGERS AND FREIGHT.

A timber deal, involving an immediate cost of approximately $1,250,000, is now being negotiated by the Canadian Robert Dollar Company in the Sayward district on Vancouver Island, British Columbia. William Dollar, head of the logging and lumbering interests of the company in British Columbia, has been invited to meet the settlers of the Sayward district on the matter.

The Sayward project affects a stand of timber estimated to contain 500,000,000 feet of lumber and has billions of feet tributary to it. There is enough timber on the tract now under negotiation to provide the company mill at Dollarton with logs for fifteen to twenty years. The plans of the Dollar Company, if it secures this timber, are to construct a standard gauge railroad twenty-five miles in length to get the logs to salt water, and they will be rafted to the mills at Dollarton.

The two new motorships being constructed in Sweden for the Pacific Mail Steamship Company have been named the City of San Francisco and the City of Panama.

The Los Veoinos Company has been established at Long Beach, California, for the purpose of engaging in importing and trading activities with Latin American countries.

The Union Construction Company, Oakland, California, was partly destroyed by fire on April 24. The machine shops, joiner room, and electrical rooms were destroyed, together with a large amount of equipment in these plants and in the yards. The plant is being used by the General Metals Supply Company in the scrapping of former United States battleships. The loss is estimated at $1,500,000, partly covered by insurance.

The Bethlehem Shipbuilding Corporation has received an order from the Federal Shipbuildinf Company, Kearny, New Jersey, for one complete Bethlehem-Dahl fuel oil burning system, to be installed in the steamship Vulcan, now being reconditioned at that plant, and converted to an oil burner.

They have also received an order from the Wilmington Steamboat Company for Bethlehem-Dahl fuel oil burning equipment for the second of their two steamers at Tampa, Florida, which is being converted to an oil burner.

This equipment has been shipped to Tampa and will be installed at that port.

UNITED KINGDOM---CONTINENTAL EUROPE

SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 5421.
FREIGHT ONLY.
SAILINGS—Monthly to Avonmouth via Panama.

EAST ASIATIC COMPANY, LTD.

B. E. Johnson, Walter & Company, agents.
837 Hastings st. W. Phone Seymour 7147.
PASSENGERS AND FREIGHT
SAILINGS—Regular sailings, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with trans-shipment to Hull.

FRENCH LINE

Compagnie Generale Transatlantique.)
Empire Shipping Co., Ltd. Phone Seym. 8014.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver to Bordeaux, Havre, Antwerp and Hamburg.

FURNESS LINE

For ... & Company, Ltd.
Furness (Pacific) Ltd.
Vancouver Block Building.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Vancouver and other Pacific Coast ports to United Kingdom.

SAILINGS—Monthly from Vancouver to Yokohama, Kobe, Shanghai and Hongkong.

GENERAL STEAMSHIP CORP.

Empire Shipping Co., Ltd. Phone Seymour 8014
FREIGHT ONLY.
SAILINGS—From Pacific Coast ports to United Kingdom and Scandinavia, as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company, Ltd.
Phone Seymour 6650.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From Angeles to Liverpool, fortnightly.

ISTHMIAN STEAMSHIP LINES

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377
SAILINGS—Intercoastal Service.
SAILINGS—Pacific-United Kingdom Service.
Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

C. Gardner Johnson & Company, Ltd.
Metropolitan Building. Phone Seymour 357.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Scandinavia.

NORTH PACIFIC COAST LINE

(Joint service of The Royal Mail Steam Packet Co. and Holland America Line.)
Royal Mail Steam Packet Company, agents.
Pacific Building. Phone Seymour 7108.
PASSENGERS AND FREIGHT.
SAILINGS—Regular freight service between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

PASSENGERS AND FREIGHT.
SAILINGS—Monthly service to Talara, Paita, Eten, Pacasmayo, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Valparaiso.

LATIN AMERICA LINE

Lea Mathews Shipping Corporation.
Alaska Building. Phone Elliott 4567.
FREIGHT ONLY.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Seattle, Portland and San Francisco to all ports on West Coast of Mexico, and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Seattle, Portland and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
Lobby No. 4, Central Bldg. Phone Elliott 6383.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
Alaska Building.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Callao, Mollendo, Arica, Iquique, Antofagasta and Valparaiso. (Other ports as inducements offer.)

Mexico---Central America--Canal Zone---South America

SAN FRANCISCO

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

W. R. Grace & Company, general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports in Peru and Chile as inducements offer.

LATIN-AMERICA LINE

R. S. Silva & Company, general agents.
149 California street. Phone Sutter 7243.
SAILINGS—Pacific Coast - Mexico - Central America.
Monthly from Portland, Seattle and San Francisco to all ports on West Coast of Mexico and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Portland, Seattle and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

McCORMICK STEAMSHIP CO.

215 Market street.
PASSENGERS AND FREIGHT.
SAILINGS—Every three weeks from San Francisco to San Jose del Cabo, La Paz, Guaymas, Topolobampo, Mazatlan, San Blas and Manzanillo.

MEXICAN NAVIGATION COMPANY

Francesco Schiaver.
555 Montgomery street. Phone Douglas 8653.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to the West Coast of Mexico.

MEXICAN STATES LINE

Williams, Dimond & Company.
310 Sansome street. Phone Sutter 7400.
PASSENGERS AND FREIGHT.
SAILINGS—Every 8 days from San Francisco and Los Angeles to West Coast of Mexico and Central America.

PACIFIC LINE

The Pacific Steam Navigation Company.
520 Market street. Phone Sutter 4032.

PASSENGERS AND FREIGHT
SAILINGS—Regular ... Guatemala, Callao, Mexico ... Mollendo, Antofagasta, Valparaiso ... Panama Canal, also to Havana ... New York, also via Cristobal to Havana ... to Spain, France, England. Steamers call at Panama, but No ... Pacific Coast ports.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
430 Sansome street. Phone Kearny 2600.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PACIFIC MAIL STEAMSHIP CO.

508 Lobby arcade. Phone Sutter 3800.
SAILINGS—West Coast Mexico-Panama (Passengers and Freight).
Twice a month between San Francisco, Los Angeles, calling at ports in Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Callao, Mollendo, Arica, Iquique, Antofagasta and Valparaiso. (Other ports as inducements offer.)

TOYO KISEN KAISHA

(Oriental Steamship Company.)
S. L. Kreider, agent.
549-51 Market street. Phone Sutter 3500
PASSENGERS AND FREIGHT.
SAILINGS—Monthly ... steamers from Oriental ports via San Francisco.

SEATTLE

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 5706.
PASSENGERS AND FREIGHT
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

W. R. Grace & Company, agents.
Hoge Building. Phone Elliott 5412.

PASSENGERS AND FREIGHT.
SAILINGS—Monthly service to Talara, Paita, Eten, Pacasmayo, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Valparaiso.

LATIN AMERICA LINE

Lea Mathews Shipping Corporation.
Alaska Building. Phone Elliott 4567.
FREIGHT ONLY.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Seattle, Portland and San Francisco to all ports on West Coast of Mexico, and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Seattle, Portland and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
Lobby No. 4, Central Bldg. Phone Elliott 6383.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
Alaska Building.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Callao, Mollendo, Arica, Iquique, Antofagasta and Valparaiso. (Other ports as inducements offer.)

LOS ANGELES

GENERAL STEAMSHIP CORP.

S. L. Kreider.
Pacific Electric Bldg. Phone Pico 6686; Bdy. 23.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

H. R. & M. F. McLaurin, Inc.
406 South Main street. Phone Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports in Peru and Chile as inducements offer.

MEXICAN NAVIGATION COMPANY

Los Angeles Freight Forwarding Company.
333 New High street. Phone Pico 2800.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to West Coast of Mexico.

MEXICAN STATES LINE

Wheaton & Kreiger.
621 Chamberlain Building.
PASSENGERS AND FREIGHT.
SAILINGS—Every 8 days from San Francisco and Los Angeles to West Coast of Mexico and Central America.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
448 Pacific Electric Building.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PACIFIC MAIL STEAMSHIP CO.

Passenger offices—503 South Spring street.
Freight offices—605 Central Building, 108 West Sixth street.
SAILINGS—West Coast Mexico-Panama (Passengers & Freight).
Twice a month between San Francisco, Los angeles, calling at ports in Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
638 Van Nuys Building.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Callao, Mollendo, Arica, Iquique, Antofagasta and Valparaiso. (Other ports as inducements offer.)

TOYO KISEN KAISHA

(Oriental Steamship Company.)
S. L. Kreider, agent.
325 Pacific Electric Bldg. Phone 876-556.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via San Francisco.

AN IMPROVED COMPRESSOR

A NEW design of single stage centrifugal compressor, whose outstanding features are strong construction, accessibility, improved pressure characteristics, and higher efficiencies, has been perfected by the General Electric Company and is now on the market.

The new compressors are of two types: single and double inlet. The single-inlet type is designed for the more general use, the double-inlet variety only being necessary when the ratio of impeller inlet and exit diameter reaches a design value demanding the use of the double inlet, to function properly.

The machines are available in capacities from 500 to 75,000 cubic feet per minute at .75 to 6 pounds' pressure. They are provided with oil pumps designed to furnish plenty of oil to the bearings. Capped holes in the tops of bearing linings are eliminated, preventing the entry of dust into the lubricating system. A heavy hinged cast iron cover is provided on one side of the middle bearing bracket, which may be lifted to inspect the return flow of oil from the lubricating system.

The pulsation point of these machines occurs at very light loads. The efficiency curves are very broad, thus showing an improvement over older types. The no-load power consumption of the new machine is between 60 and 70 per cent of that required for machines of previous design.

Outstanding construction details include bearing supports of strong construction, the casing being attached to the bearing bracket by a flange. The weight of the casing, although not great, has been distributed in such a manner as to make the unit unusually strong mechanically. This is made possible by the use of steel plates varying from $\frac{1}{8}$ to $1\frac{1}{4}$ inches in thickness in various parts of the compressor.

Expanding Air Utilized as Fire Detector

A WELL-KNOWN company, manufacturing fire detecting apparatus, has a super-sensitive system on the market that reports fires by its application of the principle that unfailingly indicates rising temperature—expanding air. They make use of air harnessed inside a thin copper tube and set it to work as a sentinel to expand at the least indication of sudden temperature increase. That the system is highly efficient is recognized in the fact that a great many of the most important ships flying the American flag have them on board as a means of preventing fires at sea.

This air-tight copper tubing, which is as thin as strong wrapping twine, runs from room to room, along corridors, over scrap baskets in staterooms where fires are so likely to occur, across steam pipes and down into remote parts of the ship, and in the hold where a fire could burn for hours without discovery until it had reached serious proportions. This tiny tubing runs in all directions throughout the entire ship, like nerves in the human body. Immediately a fire starts, the air in the tube expands and backs against diaphragms, closes an electrical current which sounds warning gongs, and an annunciator shows where the fire has started. By this means a fire is detected at a time when it is so small it may be oft times extinguished by a single bucket of water or the contents of a portable fire extinguisher before it becomes a real disaster.

The fire detecting systems are known as the Cory-Aero automatic fire alarm systems and sold and installed by Chas. Cory & Son, Inc. They have been so effective in reducing fire hazards that they were selected to equip the new Great Lakes passenger steamers Greater Detroit and Greater Buffalo.

An interesting feature of these ships is that the superstructure decks each are about three-quarters of an acre in area. The rooms on the promenade deck total 205, including twelve parlors and baths. On the gallery deck there are 254 rooms, including twelve parlors and bath rooms, while there are 165 double berth rooms on the upper deck. Passenger berths and beds total 1200. Accommodations for the deck, engineer and steward departments are on a steel deck forward and aft of the machinery.

With these two new steamships the Detroit & Cleveland Navigation Company place into service between Detroit and Buffalo two of the largest steamers on inland waters. In addition to being commodiously fitted throughout, practical accommodations have been reserved for a large number of automobiles and freight, with complete protection against fire.

SHIPYARD EXPANSION

J. J. Tynan, vice-president and general manager of Union Plant of the Bethlehem Shipbuilding Corporation, and P. C. Jurs, manager of the mine and dredging departments, visited Honolulu recently looking over the situation with relation to the establishment of a ship repair plant at that port. Mr. Jurs stated that no plans have been formulated for such a step, and that they were just looking over the ground with the idea of future expansion of the ship repairing activities of the company.

Reminiscence Section

HARDWOOD BABBITT

EDITOR Pacific Marine Review—Sir: I notice in a lot of the stuff appearing in your magazine and others of the same sort, that the term "mechanic" is used quite often in describing some wonderful thing that the engineers did. That fellow "Sea Flame" is a great one to use this term, and he also, like many others, seems to delight in referring to many of the old-timers as "Shovel Engineers." Well, sir, I want to tell you that a great many of the old-time engineers, though they had learned their business from the fire room, were better men than the shop men ever were.

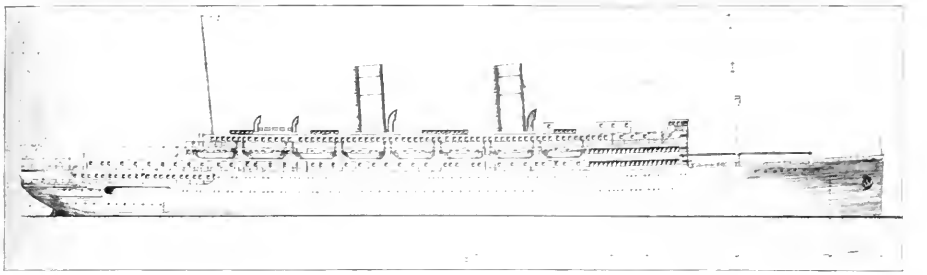
Most of us were Irish, too, and that puts me in mind of the old saying on the West Coast, that the engine room crews were all Irish, the steward's men all Cockneys, and the deck department Swedes. But at that, the Irish firemen who had become engineers kept the boats going, with an occasional lay-up at the shops to get things done which needed tools. But we did many a good job, and I will tell you of one that happened on the old San Patricio. (The name is changed a bit, as perhaps relatives of the man who did the job might not care to see this in print.) The first assistant, P. J. Murphy, was a man who had risen from the fire room and who did not claim to be a machinist, but he kept the job running well and always saw the pins and cross-heads set up a bit at the end of every voyage, while the cylinder covers were lifted, all pumps overhauled and leads taken, even though things were running well. He wanted to be sure.

One time down the coast, off one of those tamale republics, she burnt out her low pressure pin babbitt, but managed to get to an anchorage without further accident; though when stripped the babbitt was found to be all gone. There was no babbitt on board, and all hands thought it meant a wait for repairs from some other place where the job could be done. But they did not know Murphy. He was a genius, as most Irishmen are. He was not going to be stuck. Murphy took the two brasses of the burned-out pin and drilled one-inch holes into them, at right angles to the wearing face. These holes were drilled in about two inches, where the metal was thick enough, and were about one and a half inch centers. These holes were then plugged with some of the tropical hardwood which the First got from shore. The plugs were driven in tightly and left sticking out enough so that when dressed down with a wood rasp the ends would be close to where the original babbitt face was. After a rough dressing, the brasses were rolled on the pin and all high spots further filed down with coarse files, until the ends of the wooden plugs bore evenly on the pin. The job was then assembled and adjusted, and she ran fine with the hardwood filled brasses. The chief did not care to drive her too heavy at the start, but later had more confidence, and she was let go and came to port fine. From this idea of Murphy's evidently originated the "pin-babbitt" method of treating brasses, which had quite a vogue some years ago.

No doubt some of the old members of M. E. B. A. No. 35 will remember this stunt, as the engineers in the old days all belonged to that fine order, though they never were ashamed of having done their turn at the shovel. So you see, sir, that the derided "shovel engineers" made good in spite of the sneers of the newer order.

SLICE BAR.

Pacific Marine Review
The National Magazine of Shipping
JUNE, 1924



THE NEW MATSON LINER

Specifications and Plans Out for Bids on Twenty-one Knot First-Class Passenger Liner for San Francisco-Honolulu Run

FOR months the American shipbuilding world has been awaiting with keen interest the release of plans and specifications for a new first-class passenger liner for the Matson Navigation Company. Tentative plans have been under consideration for a long period, and it is now announced that financial arrangements are complete and the preliminary plans are in the hands of the shipbuilders and are released with this issue of Pacific Marine Review. These plans will, of course, be subject to considerable adjustment and change, but the main features are substantially as they will appear in the finished ship.

The problem facing the naval architects was accommodations to take care of 500 first-class passengers, with their baggage and their automobiles, if taken, together with a limited amount of express and refrigerative freight on a schedule of sailing which involves 21 knots speed at sea.

To meet Matson standards for first-class accommodations, the dining saloon must be of capacity to seat the 500 passengers at one time, the ventilating system must supply the public rooms with cooled air, and many other refinements must be installed, all of which demand great care and skill in the disposition of space and in the selection and allocation of auxiliary machinery and fittings.

The proposed vessel to cover these requirements is shown by the plans reproduced herewith and has the following characteristics:

Length over all	578 ft. 0 in.
Length between perpendiculars	552 ft. 0 in.
Beam molded	75 ft. 0 in.
Depth molded to shelter deck	45 ft. 0 in.
Depth molded to promenade deck	54 ft. 0 in.
Displacement	18,000 tons
Shaft horsepower	24,000
Operating sea speed	21 knots

Turbo-electric drive is to be used with twin screws. Steam will be supplied by 12 oil-fired water-tube boilers. Practically all auxiliaries will be electrically driven, and the galley will be fitted with electric ranges, bake ovens, heating tables, and other accessories. A tiled swimming tank 16 feet by 30 feet will be installed.

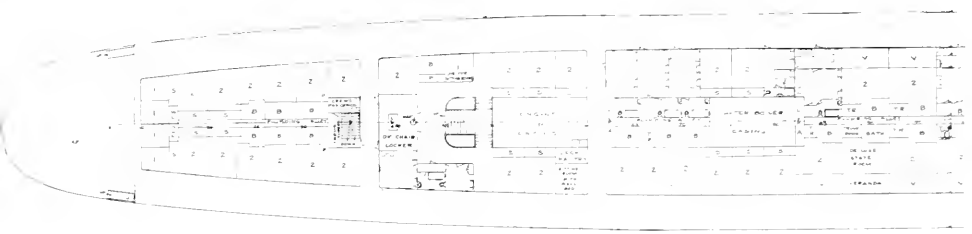
The hull is to be built to comply with the rules of the American Bureau of Shipping and also of Lloyd's Register for a complete superstructure ship.

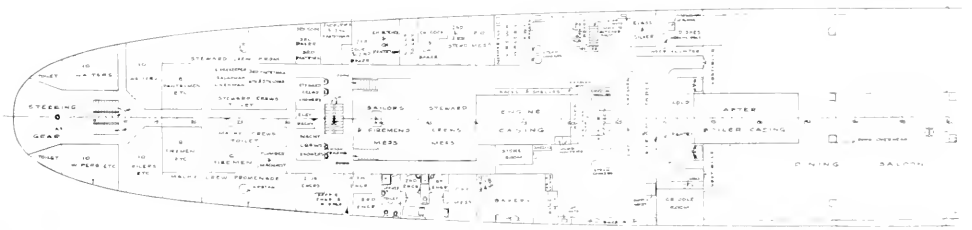
This vessel will cost about $6,000,000, and her construction will be the most important privately-financed shipbuilding venture undertaken in America for at least ten years back.

Practically, her advent in the Honolulu run means a first-class passenger schedule of 4½ days from San Francisco to the Hawaiian Islands. In conjunction with the Maui and the Matsonia, the new vessel will make possible weekly sailings of first-class passengers from either port.

PROPOSED NEW FIRST CL

To Be Built For Matson Navigation Com





Promenade, Shelter and Upper Deck Plans, Sho

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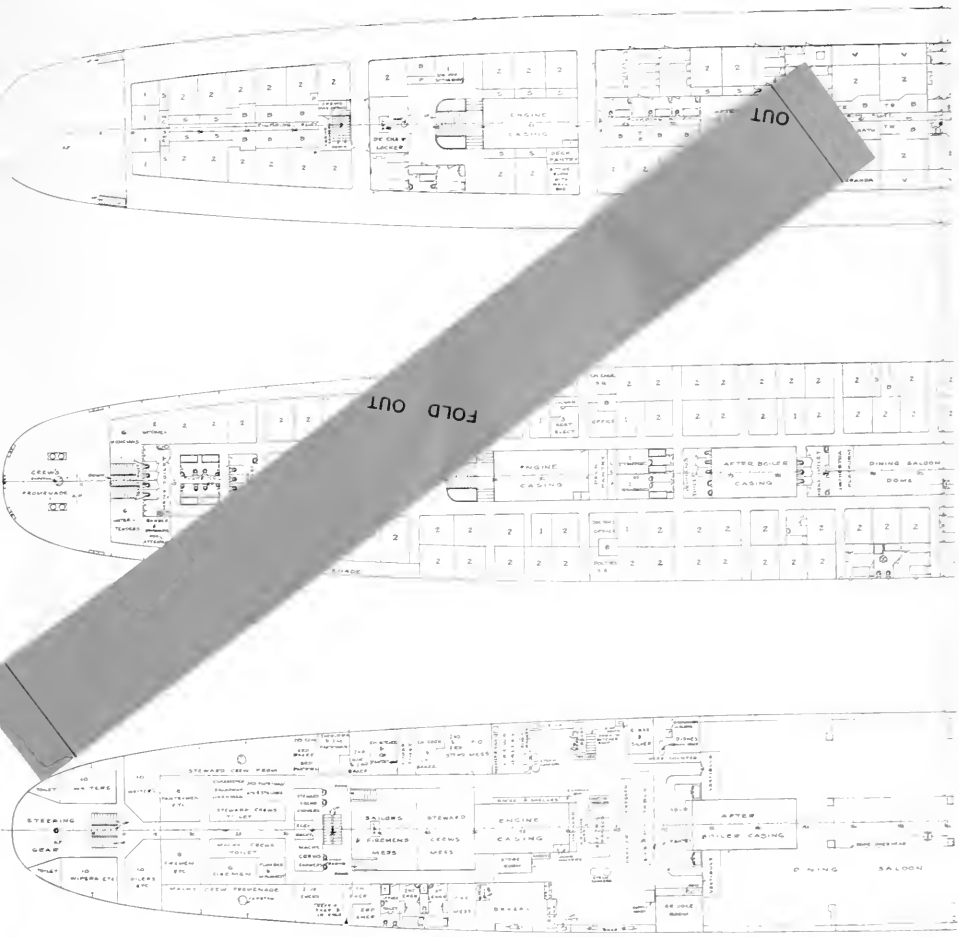

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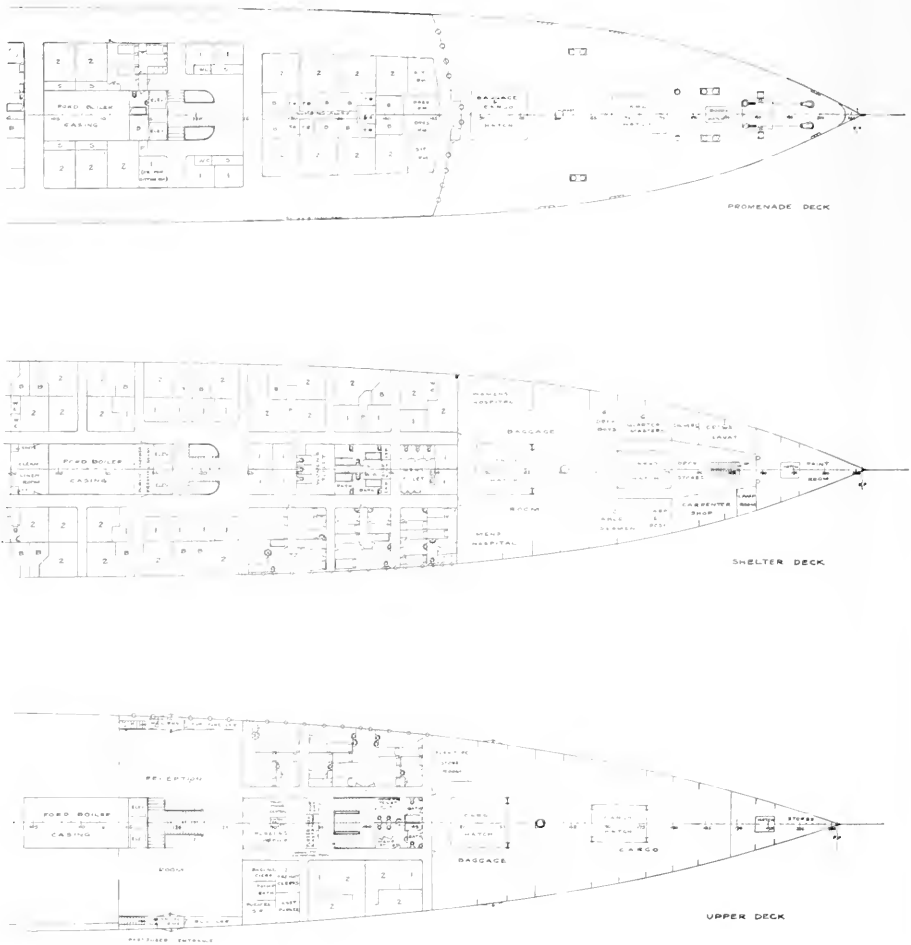
pany's San Francisco-Honolulu Run



wing Passenger Accomodation Arrangement

Vol. XXI JUNE, 1924 No. 6

Pacific Marine Review

THE NATIONAL MAGAZINE OF SHIPPING
576 Sacramento Street, San Francisco
339 AT 30 CHURCH STREET, NEW YORK

J. S. HINES, Publisher
A. J. DICKIE, Editor
PAUL FAULKNER, Publicity Manager
BERNARD N. De ROCHIE, Business Manager

Official Organ of the Pacific American Steamship Association and the Shipowners' Association of the Pacific Coast.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879.

Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 20th.
Subscription price, a year (domestic)..... $2.00
(foreign)..... 3.00
Single copies ..... .25

AMERICAN OVERSEAS MERCHANT MARINE

Consolidation With a Minimum of Supervision Directed Toward the Elimination of Emergency and the Procurement of Permanency Under Private Ownership

By LEIGH C. PALMER
President, Emergency Fleet Corporation

IN order to convince shippers here and abroad that that our maintenance of service on the essential trade routes is permanent, our organization must be run in a strictly business fashion. Formerly shippers were more or less justified, perhaps, in declining to give our vessels the greater portion of their shipments, as there was then everything to indicate that the fleet was not organized and working on a business-like basis, and that it had none of the earmarks of permanency. I am sure that we are now in a position to convince shippers and passengers that for their own best interests they should use American-flag ships and lend their support to this end. As we proceed to putting our services on a strictly business-like basis and concentrate our efforts on getting the cargoes, we will reduce the present losses and produce a much better return to the taxpayer for the funds intrusted to us. As shippers find that our services are being conducted in a reliable and business-like manner, there will be less necessity to appeal to their patriotism.

Correct Figures Necessary

It is difficult to try to make constructive deductions from our operating figures on foreign trade routes, as long as the tonnage is not effectively disposed over those routes and as long as operations are not conducted economically. Under such circumstances the books show figures which do not represent normal losses incurred in the most efficient method of operation. The correct figures are necessary to enable us to determine whether or not we are justified in recommending the discontinuance or the expansion of a particular service. As we consolidate the routes and make the most efficient use of the vessels we have, with respect to frequency of sailings, turn-around, character and amounts of cargoes, we can get a real analysis of losses under the rate schedules as they now exist and show where we need to concentrate the greatest attention for improvement. With that information in hand we are in a position to know what our differential is on the different routes with respect to foreign operated tonnage, whether or not national aid in any form is needed, and how much that aid should be in order to keep our merchant marine effective and assure the owners or operators a normal profit comparable with that of other business.

Consolidation

In consolidating the services, none of the essential trade routes will be given up, and on many of the routes there will be no recommendation for any reduction of tonnage. Some of the routes are highly competitive, however, where the normal demands of commerce are fully provided for by American and foreign services. Services on these routes should be maintained with a view to offering a reasonable frequency of sailings and not with a view to attempting to give more service under present conditions than is necessary to protect American commercial interests and to hold our position until trade conditions permit us to expand.

As general trade conditions improve so that freight rates are sufficient to meet the costs of operation, the services can be gradually expanded to meet additional demands, but additional tonnage should not be put on with a view of maintaining an artificially low scale of ocean freights which would force the National Treasury to pay a still larger part of the costs of transportation and which would have the definite effect of preventing the lines becoming self-sustaining and, therefore, salable. We are planning to have less detailed supervision of the operators. We wish to give them more initiative and responsibility, with the minimum of supervision compatible with the protection of government funds.

Retrenchment

Last August the necessity for national retrenchment induced the budget officers, after consultation with the Shipping Board, to recommend a reduction in the appropriation of about fourteen million dollars. The President approved this figure and a bill embodying this limitation of funds was recently passed by the House and the Senate. The wishes of the President and of the country, as expressed in this action for economy, have guided the Fleet Corporation in its recommendations.

A merchant marine without a living rate can never be a real merchant marine. Shippers want stability of rates, regularity of services and permanency, and these cannot be had by running the vessels at heavy loss. Neither can we afford to absolutely ignore all conferences. The rate wars that may follow would create great disturbance in business and would result in no benefit to any one. We should keep in touch with these conferences so as to maintain stable rates for our shippers. Before adopting any plans for outside assistance, we should inquire whether such plan

* Gist of an address before the annual meeting of the Chamber of Commerce of the United States, Cleveland, May 6, 1924.

will actually aid the merchant marine, both privately and publicly operated, and tend to put it more nearly on a self-sustaining basis, or whether it is in effect only an aid to some particular class of shippers.

Foreign Aids

A study is being made of the elements that particularly benefit the merchant marines of foreign countries to see what is the value of that part of the differential which is due to foreign state aid, direct or indirect.

There is undoubtedly state aid for shipping in practically all foreign countries; but something more than actual money aid is accountable for success. That is, the desire of the people to favor their own ships, and the vital interest they all have in the efficiency of their services. In some countries we find all the great shipping companies represented in the legislative branches of the government and the boards of trade and port facilities are composed of the most important shipping people.

Another very important point is the great amount of investment that some shipping nations have in foreign countries. That plays a very large part in getting return cargoes; and if permanent investments were made in growing foreign countries, like the great nations of South America and in the Far East, there is no doubt that we also would benefit largely in return cargoes.

In the shipping business America is undoubtedly dealing in markets where our costs of production are greater than those of our competitors; and this is a fact that must be fully recognized. Another point is that there are not so many people in foreign countries who are spending their time complaining instead of using their brains to actually fight foreign competition in such a way as to produce results. It must amuse foreigners to see some of our people endeavoring to compete with them in shipping by using no more powerful tactics than the so-called "spread-eagle speeches." Foreigners can stand that kind of competition as long as we put it up. We must continue to study foreign methods and practices and select the best of them for our own advantage.

Return Cargoes

We hear of ships returning in ballast with very small homeward cargoes. We hear of propositions of different countries to so modify the laws that every ton of their commerce will be carried both ways in their own bottoms. As a practical business matter, we should follow some of the methods of cooperation that have been successful in other lines of business in this country. Whatever we may do our return cargoes will probably not be satisfactory without some cooperation with foreign countries.

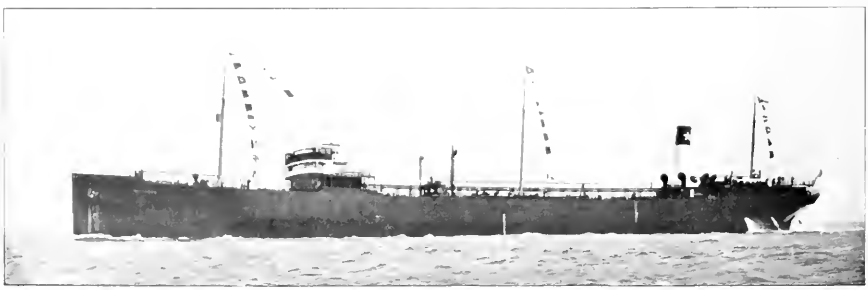
I am confident we can build up a strong and permanent merchant marine. This will, of course, take time and it will mean that we must cut out changes of policy and personnel. Many of the faults that have been most criticised have been due to the excessive turnover of personnel during the last few years. The more turnover we have the greater the joy of our competitors. They are not fearful of the dollars we pour in as long as our personnel turnover is high. The only thing that will give our foreign competitors much concern is to find that we are really working and getting down on a business basis. The more we eliminate the talk and go after the business, the more will they have need to fear our competition.

Permanency versus Emergency

If Congress can let it be known in no mistakable terms that it is as strongly supporting our merchant marine, both privately and publicly owned, as the governments of foreign countries are supporting their nationals in the shipping business, there will be no doubt of our success, and private interests will soon find encouragement to purchase and take over the routes. There should be a very clear announcement of policy so that the word "emergency" will be forever eliminated and that the idea of permanency shall take its place. A pronouncement limited to a five-year period will not be sufficient for this need, for the merchant marine will exist as long as we have commerce with foreign countries and as long as there is any need for the national defense.

There has been much discussion as to what has been accomplished in the task that five years ago was considered almost hopeless. Undoubtedly there has been a very great improvement and we are now giving an excellent foreign service on which shippers and passengers can depend. Of course, a great deal remains to be done in organization and economy, and we are directing our attention to this and to constant improvement of the service.

The Chamber of Commerce can be very helpful in continuing its studies to benefit the merchant marine and our foreign trade, and I feel that a very close contact will be very beneficial to us all. The American merchant marine is here to stay, a permanent part of our national business life and a powerful arm of our national defense.



The Southern Pacific tanker Tamiahua, a product of the Oakland yard of the Moore Shipbuilding Company.

SOME PHASES OF GOVERNMENT IN BUSINESS

A Suggestion to Associated Business that Self-Regulation be Substituted for Legislative Enactment and a Practical Example of the Out-Working of that Suggestion

By HERBERT HOOVER, Secretary of Commerce*

IN these times of muddled thought it is sometimes worth repeating a truism. Industry and commerce are not based upon taking advantage of other persons. Their foundations lie in the division of labor and exchange of products; for through specialization we increase the total and variety of production and secure its diffusion into consumption. By some false analogy to the "survival of the fittest" many have conceived the whole business world to be a sort of economic "dog eat dog." We often lay too much emphasis upon its competitive features, too little upon the fact that it is in essence a great cooperative effort. And our home-made Bolshevist-minded critics to the contrary, the whole economic structure of our nation and the survival of our high general levels of comfort are dependent upon the maintenance and development of leadership in the world of industry and commerce. Any contribution to larger production, to wider diffusion of things consumable and enjoyable, is a service to the community and the men who honestly accomplish it deserve high public esteem.

The thing we all need to searchingly consider is the practical question of the method by which the business world can develop and enforce its own standards and thus stem the tide of governmental regulation. The cure does not lie in mere opposition. It lies in the correction of abuse. It lies in an adaptability to changing human outlook.

Business Ethics Problem

The problem of business ethics, as a prevention of abuse, is of two categories: those where the standard must be one of individual moral perceptions, and those where we must have a determination of standards of conduct for a whole group in order that there may be a basis for ethics.

The standards of honesty, of a sense of mutual obligation and of service were determined in the ten commandments and the Sermon on the Mount. They may require at times to be recalled. And the responsibility for them increases infinitely in high places either in business or government, for there rests the high responsibility for leadership in fineness of moral perception. Their failure is a blow at the repute of business and at confidence in government itself.

The second field and the one which I am primarily discussing is the great area of indirect economic wrong and unethical practices that spring up under the pressures of competition and habit. There is also the great field of economic waste through destructive competition, through strikes, booms and slumps, unemployment, through failure of our different industries to synchronize, and a hundred other causes which directly lower our productivity and employment. Waste may be abstractly unethical, but in any event it can only be remedied by economic action.

The Cure

If we are to find solution to these collective issues outside of government regulation, we must meet two practical problems:

First, there must be organization in such form as can establish the standards of conduct in this vast complex of shifting invention, production, and use. There is no existing basis to check the failure of service or the sacrifice of public interest. Some one must determine such standards. They must be determined and held flexibly in tune with the intense technology of trade.

Second, there must be some sort of enforcement. There is the perpetual difficulty of a small minority who will not play the game. They too often bring disrepute upon the vast majority; they drive many others to adopt unfair competitive methods which all deplore; their abuses give rise to public indignation and clamor which breed legislative action.

Method of Application

I believe that we now for the first time have the method at hand for voluntarily organized determination of standards and their adoption. I would go further; I believe we are in the presence of a new era in the organization of industry and commerce in which, if properly directed, lie forces pregnant with infinite possibilities of moral progress. I believe that we are, almost unnoticed, in the midst of a great revolution—or perhaps a better word, a transformation—in the whole super-organization of our economic life. We are passing from a period of extremely individualistic action into a period of associational activities.

Practically our entire American working world is now organized into some form of economic association. We have trade associations and trade institutes embracing particular industries and occupations. We have chambers of commerce embracing representatives of different industries and commerce. We have the labor unions representing the different crafts. We have associations embracing all the different professions—law, engineering, medicine, banking, real estate, and what not. We have farmers' associations, and we have the enormous growth of farmers' cooperatives for actual dealing in commodities. Of indirect kin to this is the great increase in ownership of industries by their employes, and customers, and again we have a tremendous expansion of mutualized insurance and banking.

Although such associational organizations can trace parentage to the middle ages, yet in their present implication they are the birth of the last fifty years, and in fact their growth to enveloping numbers is of the last twenty-five years. We have, perhaps, 25,000 such associational activities in the economic field. Membership, directly or indirectly, now embraces the vast majority of all the individuals of our country. Action of wide import by such associations has become an important force of late in our political, economic and social life.

It is true that these associations exist for varied purposes. Some are strong in recognition of public responsibility and large in vision. Some are selfish and narrow. But they all represent a vast ferment of economic striving and change.

Collective Action

Ever since the factory system was born there has been within it a struggle to attain more stability

* Extract from an address before the annual meeting of the Chamber of Commerce of the United States, Cleveland, May 6, 1924.

through collective action. This effort has sought to secure more regular production, more regular employment, better wages, the elimination of waste, the maintenance of quality or service, decrease in destructive competition and unfair practices, and ofttimes to assure prices or profits. The first phase of development on the business side was "pools" in production and distribution. They were infected with imposition upon the public and their competitors. In some part they were struggles to correct abuse and waste. They were followed by an era of capital consolidations with the same objects, but also to create a situation of unbreakable agreements. Both were against public interest and the public intervened through the Sherman act. Yet underneath all these efforts there was a residuum of objects which were in public interest.

Associational activities are, I believe, driving upon a new road where the objectives can be made wholly and vitally of public interest. The legitimate trade associations and chambers of commerce, with which I am now primarily concerned, possess certain characteristics of social importance and the widest differentiation from pools and trusts. Their membership must be open to all members in the industry or trade, or rival organizations enter the field at once. Therefore, they are not millstones for the grinding of competitors as was the essence of the old trade combinations. Their purpose must be the advancement of the whole industry or trade, or they cannot hold together. The total interdependence of all industries and commerce compels them in the long run to go parallel to the general economic good. Their leaders rise in a real democracy without bosses or political manipulation. Citizens cannot run away from their country if they do not like the political management, but members of voluntary associations can resign and the association dies.

Industrial Democracy

I believe that through these forces we are slowly moving toward some sort of industrial democracy. We are upon its threshold, if these agencies can be directed solely to constructive performance in the public interest.

All this does contain some dangers, but they will come only from low ethical standards. With these agencies used as the machinery for the cultivation and spread of high standards and the elimination of abuses, I am convinced that we shall have entered the great era of self-governing industry and business which has been a dream to many thinkers. A self-governing industry can be made to render needless a vast area of governmental interference and regulation which has grown up out of righteous complaint against the abuses during the birth pains of an industrial world.

Standards

I am, of course, well aware of the legal difficulties that surround certain types of associational work. I do not believe that the development of standards of conduct or the elimination of abuses in public interest has ever been challenged as a violation of the Sherman act. Moreover, to establish either a physical or a moral standard directly sharpens competition.

These associational activities are the promising machinery for much of the necessary determination of ethical standards, for the elimination of useless waste and hardship from the burden of our economic engines. Moreover, we have in them not only the agencie. by which standards can be set, but by cooperative action among the associations representing the different stages of production, distribution and use, we can secure a degree of enforcement far wider than mere public opinion in a single trade.

When standards are agreed upon by the associations representing the manufacturer and distributor and by those representing the user, we have a triple force interacting for their enforcement.

A Practical Example

Now I do not wish any one to think my feet are not on the ground in all this, and I propose to give a few illustrations from real life of what can be effected by constructive associations and by cooperation among them.

The Department of Commerce has, at the request of the lumber industry, held a number of conferences to discuss the rules of the road in that industry and its relations to the other industries and the common good. The problem was to establish more general and more constructive standards of practice, ethics, and waste elimination.

One-Inch Board?

In the toil of formulating these standards there arose a question of how thick a one-inch board should be. It sounds easy. But it quickly developed to be a question whether it should be one inch thick when it was green; after it was dried; when planed on one side, or when planed on both sides. It developed not only that a choice had to be made among these four alternatives, but also that this choice had to be based upon a proper consideration for the conservation of our forests on one hand, and the provision of a material of such structural character as to constitute a square deal to the consumer on the other. It also developed that there were thirty-two different thicknesses of a one-inch board in current use and that some minority of manufacturers in the drive of unfair competition were gradually thinning the board until it threatened to become paper. There also had to be developed the exact differences which threw a board into four or five different grades, and there had to be a determination of standard trade names for different species of wood. The point was that an accurate standard had to be determined before discrimination as to fair dealing and public service could be gauged. That occasion was the foundation of ethics in one-inch boards.

These conferences established some eighty questions involving the whole technology of lumber and comprising for the first time a definite series of national standards. Here is the sum of our problem. It could only be accomplished through an association in the industry. It is proof of industrial conscience and service.

Enforcement

The second part of the practical problem which I enumerated before is enforcement. Again associational activities were called upon. The manufacturers were not alone in these conferences, but the distributor and consumer were also represented by the Architects' Association, the Building Contractors' Association, the railway and other purchasing associations, and the retailers' associations. The action and reaction of the buyer and seller upon each other in their desire to secure fair dealing in industry can procure enforcement. Joint inspection bureaus have been erected where complaint for violation can be lodged and determination made. Enforcement may not be 100 per cent, but the standards are there and a sense of individual responsibility and self-interest will eventually, I am confident, make them universal.

(Continued on Page 33, Advertising Section)

SAILING ON A REAL SHIP

Some Notes on a Trip Around the Horn in the David Crockett, Fifty-two Years Ago

THE following interesting letter was recently received from W. Henry Grant of New York:

Editor Pacific Marine Review: The reading of "David Crockett, Clipper Ship," in the April issue of Pacific Marine Review stirred old memories and caused me to look over the copy I have of the captain's log of the David Crockett's voyage westward, New York to San Francisco, in 103 days, November 6, 1871, to February 17, 1872.

Well do I remember the greeting the sea gulls gave us to that loveliest of lovely harbors, San Francisco, as we came to anchor. Still more vivid is the recollection of going to the foremast head at the captain's request to look for the Farallon Islands' light, which we sighted about 1 a. m., hailing pilot at 2 a. m. and entering the Golden Gate at 6 a. m. (I was then a boy just past thirteen—December 17, 1871.)

F. C. Matthews' record from the captain's log nearly corresponds to the copy of the log made by my uncle:

New York to the line	20 days
Equator to 50° So.	30 days
"Was north bound"	12 days
Crossed line	82 days
Line to San Francisco	21 days anchor
Total	103 days

My copy has:

New York to line	20 days
Line to 50° So.	31 days
50° to 58° 21′ to 50	11 days
50° So. to equator	20 days
Crossed line northward	82 days
Line to San Francisco	21 days
Total	103 days

Captain Burgess was a master of seamanship, and though I was such a young and small a boy, he taught me many things about sailing a ship. In fact, I thought it easier to sail a "three-sky-sail" ship than to sail a sloop; easier to balance and steer. He also loaned me his big book on navigation, and though I had only learned arithmetic as far as fractions, having been taken from school on account of headaches two years earlier, I had no difficulty in understanding the use of sines and cosines, tangents and cotangents, and logarithms when applied concretely to the noon observations.

I was glad to get some of the facts regarding Captain Burgess' early life. He stood six feet in his stockings and weighed 200 pounds, and certainly stood squarely on his feet on the quarter deck when he was in command of the watch. He was cautious, but a great sailer as well as sailor. He had the true feeling of the sport of fine sailing. I remember his taking the ship through a squall once with every sail bent. The log ran out at something like 13½ knots but I estimated that we were running over 15, and trust me it was rare sport. My uncle and I got on the cabin roof to watch it. The ship David Crockett was then like a thing of life, a race horse, a gull, instinctively responsive with the very joy of the runner. Her model and balance were perfect.

The David Crockett was my only real ship experience. I do not count the hundred or more thousand miles on steamers as of the same order, and the impress of the ship and the voyage are almost of yesterday to me now. I think I could go to any part of her in the dark and find the rope wanted.

I thought Captain Burgess went to Yale; Mr. Matthews makes it Brown. I wonder where one could find out more about Captain Burgess. I have a good photograph of him. I never heard him swear or use bad language in any form or tell any questionable stories—neither he nor the first officer, Mr. Griffiths, nor the second officer, Mr. Conrad. The second mate was a very competent worker and manager of men.

I also wonder if there is a model of the old ship anywhere or a photograph showing her lines. I have stood at her wheel by the hour, with the quartermaster and sometimes, especially at night, turned the wheel alone almost by the half-hour, steering at night by both binnacle and stars. I felt a great impression of the possibilities in a small boy to do something big.

I fear I have talked more about my personal experience than about Captain Burgess as I intended. Captain Burgess lost his life off Cape Horn in a storm. The jib tackling was loose and knocking about, and he took a hatchet forward to cut it loose, but was struck by a heavy wave and carried overboard. They heard his cry but did not ware ship. He belonged to the type it is well for us to know. My experience generally with American ship officers has been most satisfactory.

Some fine sailing ships in winter quarters in the Oakland estuary.

FOUNDED in 1849 and very actively engaged in the design and construction of mining machinery, the Union Iron Works of San Francisco was confronted in 1880 with a proposal which for daring and vision has had few if any equals in the history of American industry. This proposal was that a steel shipbuilding plant be established at San Francisco to take advantage of the revival of the United States Navy building program then being sponsored by Secretary of the Navy Whitney.

This idea was due to the friendly rivalry of two great Pacific Coast engineers, Irving M. Scott and George W. Dickie. Scott with the Union Iron Works, and Dickie with the Risdon Iron Works, had been for eight years competitors in nearly every large mining machinery bid for the mines of California and Nevada, and these two men were responsible for some very daring and original hydraulic and steam engineering during that period, particularly in the lower levels of the Comstock lode.

In 1880 they decided to join forces, and after considerable negotiation the Union Iron Works was reorganized, as shown by the heading cut on this page. Of the five men who formed the executive staff, as shown on this letter head, only one, Henry T. Scott, of the Pacific Telephone & Telegraph Company, is now alive.

With no ship plate or shapes available nearer than Pittsburgh by rail or Baltimore or Europe by water around the Horn, it would seem that this infant industry was doomed to failure from the start. But the capitalization was set at $1,000,000, a site was secured, plans for shops and yard were laid broadly and with great originality and skill, a contract for a steel cargo vessel was secured in 1884, mining work was still plentiful, ship repairs were not infrequent, and gradually a plant was built up until in 1887 the Union Iron Works was confirmed with the approval of the Navy Department through the award of a contract to build the cruiser Charleston. From that time on, although there were many troubled periods, there was no doubt in any one's mind as to the final outcome, and Union Iron Works became one of the points of interest in and near San Francisco.

One of the great difficulties at the start was to get a sufficient number of trained expert workmen, and this problem being recognized from the beginning by the management, they planned for a very comprehensive and extensive apprenticeship system. Through the outreach of this system, the Union Iron Works became in a very real sense a technical university whose alumni furnished to the whole Pacific Coast and to much of the rest of the country many of their best mechanics and engineers.

The first steel vessel built in the yard was the Arago of 947 gross tons. The keel for this vessel was laid November 6, 1884. The appearance and development of the plant at that time were as shown in the illustration. In twelve years thereafter there had been finished and delivered a total of forty-four vessels, in-

These two facing illustrations make a panorama of the plate storage racks, shipyard shops, photographs were taken with a pin-hole lens camera by

cluding the cruisers Charleston, San Francisco and Olympia, the coast defense vessel Monterey, and the battleship Oregon.

The plant covered twenty-two acres, nine under permanent shop coverage. All the ship ways were completely surrounded with permanent frame scaffolding supporting overhead traveling cranes. Every shop was served by electric or hydraulic cranes. A hydraulic lift dock capable of lifting 4000 tons had been installed and was in constant demand for drydocking vessels. The shops had been equipped with a variety and an amount of machines and tooling not equalled at that time in any other shop in America. About three thousand men were given constant employment. By 1902 this figure had grown to five thousand.

Artist's conception of the Potrero plant of the Union Iron Works about 1885.

The distance from manufacturing centers, cost of transportation, and necessity for training boys, led to the early adoption of a policy of independence, and to the equipping of the plant for the manufacture of every item necessary for steam freight, passenger or naval vessels.

In an article published in Machinery in 1897, John Richards says:

"A large war vessel contains in all from fifty to one hundred steam engines. Of these there are made in Eastern works little more than the main propelling engines, all the auxiliaries for pumping, handling, lighting and so on being purchased from other firms or companies who make a specialty of these things, but at the Union Iron Works these are all made, as are the fittings of all kinds, down to water and steam cocks even, and all of the fittings in the electrical equipments.

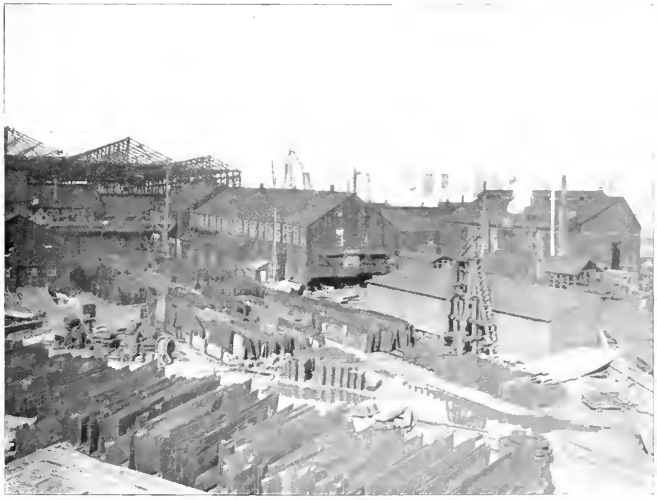
"Any skilled person in passing through the workshop can see that at least a fourth of all the men are engaged in making such things as are purchased in the Eastern shipbuilding yards. This calls for an extensive and varied equipment of tools, indicated by the fact that in one year (1897) there was added to the tool account $450,000, the largest amount perhaps ever purchased in the same length of time by any 'going works' in this country.

"An elaborate equipment of tools of a varied character is required in this manufacture and is provided by necessity and also by choice. There are no resources outside of the works nearer than two to three thousand miles away where supplies can be purchased.

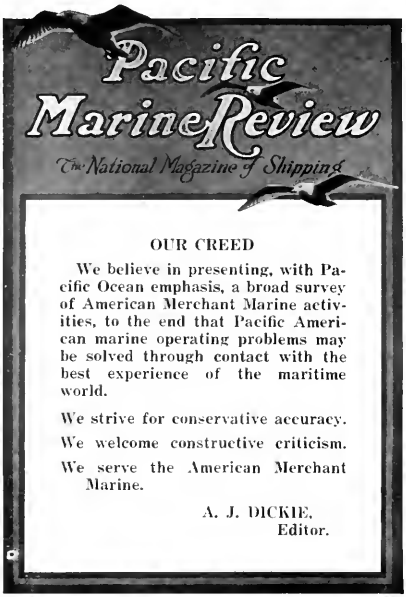
"Among the handling tackle in the works are twenty-one traveling cranes: five of them raise fifty tons each and six of them twenty tons; sixteen are operated electrically."

A famous Scotch shipbuilder, Mr. (afterwards Sir) Archibald Denny, made a trip round the world in 1898 and '99, in the course of which he inspected all the shipbuilding establishments to which he could get access. Of his visit to America and particularly to San Francisco, he says:

"My visit to America was to me most interesting and instructive. Dealing first with our own business of shipbuilding, I was in America in the year 1882, and at that time there were three small shipbuilding yards on the Eastern seaboard — one at Wilmington, one at Chester, and one at Philadelphia; at least, these were the three principal ones, and I never heard at that time any others of importance mentioned. Their business was small and without the slightest effect upon the shipbuilding competition of the world. This year I visited not only the Eastern seaboard, but also San Francisco. There I found a yard of immense area and most perfectly equipped, in some respects in advance of any yard in this country.



shipbuilding ways, and outfitting docks of the Union Iron Works, San Francisco. The James Jardine from a window of the office building in 1900.



Government in Business

NOTWITHSTANDING the protests from the shipbuilding industry, there seems to be a determined effort on the part of Congress to force all Shipping Board repairs into navy yards. The situation is well described by an editorial in a recent issue of our esteemed contemporary, the Marine Journal of New York, as follows:

"There is an organized navy yard bloc in the House of Representatives—one of the most selfish blocs that plague that organization. It has no regard whatsoever for the interests of the private American shipbuilding industry, or for the welfare of the treasury, or for the economical operation of the merchant marine.

"This bloc, in the face of severe experience, demands that the navy yards share in the work of refitting or repairing the government-owned merchant fleet. It means nothing to these headstrong politicians that it actually cost the Shipping Board $520,000 to recondition the former army transport Aisne, when the original bid was for $390,000. It is stated that the Federal Shipbuilding Company—a well equipped private concern—reconditioned three of these ships for $1,004,000, or $335,000 each; and that the Staten Island Shipbuilding Company reconditioned one for $389,500. It is well remembered also that while the navy yard estimates were $952,000 for reconditioning the passenger steamer America, the actual cost exceeded this by the amount of $100,000.

"Maintenance of the navy yards, however, is no fit charge upon the American merchant marine, government-owned or privately owned—and it is as unjust for the government of the United States to enter into commercial competition with the privately-owned shipyards and repair yards of the United States as it would be for the government to set up manufacturing or mercantile plants and go into competition with the manufacturers of this country. This would not be attempted; there would straightway be too many votes against it.

"There is urgent need of an organized, determined fight in Congress on the part of all the industrial interests of the United States. This Republican Administration has been making a great deal of talk about getting the government out of business. Let it keep its word by keeping the government out of the ship repair and reconditioning business."

Section 28

ON May 8 the Shipping Board, by a vote of four to three, Commissioners Benson, Haney and Thomson voting in the negative, "adopted a resolution withdrawing its limited certification to the Interstate Commerce Commission regarding adequacy of American flag tonnage to certain foreign trade ranges upon which the Interstate Commerce Commission has ordered the suspension of Section 28 to be lifted as of June 20, 1924."

The Board frankly admits in its published statement that it withdraws in deference to the pressure from exporters and importers, and the testimony developed at the Congressional hearing, and that it looks to these shippers for aid in advancing the merchant marine program. The statement issued closed as follows:

"It is the primary desire of the Shipping Board to secure the cooperation of shippers and railroads in support of the American merchant marine and in giving this concession it expects that shippers will in turn do their part in the building up of American shipping.

"It is the intention of the board, in conjunction with other departments of the government interested, and with the commercial interests affected, to continue the intensive study of the subject with the purpose of making Section 28 effective within a reasonable time.

"It is expected that by the beginning of the new year the situation will have so clarified itself that Section 28 may then go into effect."

It is now the move of the American shippers, ship operators, and rail executives to lay all the cards on the table and plan for effective cooperation in overseas shipping. There is no doubt that if these three factors can get reasonably unified, the Shipping Board and Congress will fall in line.

The opinion of the shipowning and operating group seems to be divided. The interests of the leading ports of the United States are so diversified that there will always be this division of opinion.

A suggestion which seems to us full of common sense comes from the National Merchant Marine Association, as follows:

"In the hearings before the House Merchant Marine

Committee it was brought out that, in a number of instances, American business would be injured by the application of the section as planned by the board. The principle of the section, however, is sound, and, if properly applied, would be of great benefit in developing an American merchant marine. It is felt, for instance, that application could be made in services where adequate shipping facilities under the American flag exist, and that, by starting in this way, the application could gradually be extended through the extension of facilities until the whole foreign trade could ultimately be served properly."

Try the principle in a small way on the routes to a single South American country, for instance, and carefully study the results. If beneficial, extend the system gradually. Why not?

Marine Casualties

THE first three months of 1924 brought an unusually large list of marine disasters. During this time the ships lost totaled 21 vessels of 51,712 gross tons. Of this total three vessels are missing, leaving no trace. These were the Mutlah du Italian, steel screw steamer of 3641 gross tons built at Glasgow in 1907 with triple expansion reciprocating engines and Scotch marine boilers; the Saian Maru, a Japanese steel screw steamer of 1823 gross tons built at Greenock in 1882 with compound engine and Scotch marine boilers; and the Mont Rose, a French steel screw steamer of 3848 gross tons, built in France in 1902 with triple engines and Scotch boilers. Of the balance, 7 were fires, 7 wrecks, and 2 foundered.

The total of lost ships for the corresponding quarter of 1923 was 22 with an aggregate gross tonnage of 36,730. It can be readily seen, therefore, that the opening of 1924 has been bery hard on marine underwriters.

Shipmaster Thirty-five Years

WHEN the Minnetonka, new 21,998 gross ton liner of the Atlantic Transport Line, arrived in New York May 12 on her maiden voyage, she was under the command of Captain Thomas F. Gates. The record of this steamship master is noteworthy in many ways.

He is the senior passenger liner captain in point of continuous service for the North Atlantic ferry lanes. His first command was the first Atlantic Transport liner Missouri, in 1889, and during thirty-five years' service with that line he has commanded eighteen of its liners.

Captain Gates was chief officer of the Missouri in 1887 and was in charge of her boats when they rescued 735 people, including 20 babies less than one year old, from the sinking immigrant ship Denmark. An illustration of this rescue is shown on page 339 on this issue.

Captain Gates has been a steamship officer continuously since 1883. He began his sea career as an apprentice in the sailing ship Dorset in 1878.

Radio Fog Signals

A POWER tube radio fog signal transmitter was placed in commission on Ambrose Channel Light Vessel on April 22, 1924, without change of characteristic of the signal. This is the first tube transmitter used in this country for fog signal purposes. Masters of vessels have been requested to test these signals and advise the Lighthouse Service of the results obtained.

This transmitter was installed after extensive tests which resulted satisfactorily, indicating freedom from directional distortion, lessened interference, and increased efficiency. Tests with this transmitter for night effect indicated practically no distortion due to this cause affecting the use of the signals for navigational purposes. Data as to these tests will be published later.

French Testimonial

Captain Maurras, of the steamer Paris, French Line, has written the following letter, dated April 21, 1924:

On our four latest trips from Havre to New York we had occasion, owing to overcast sky and misty horizon, to make use of the Nantucket, Fire Island, and Ambrose radiobeacons to check our position. All the observations made proved to be most satisfactory.

On the 7th of March we obtained with our radiocompass bearings of the Nantucket beacon at a distance of 115 miles in daytime without any sensible error.

Having requested on one trip the operation of the beacon by clear weather, we were enabled by taking together radio bearings and sight bearings to check our radiocompass. We are now able to obtain bearings with a maximum of 2 degrees error at 150 to 200 miles, and with less than 1 degree from 50 to 100 miles distance.

The use of radiobeacons proves to be now most valuable and reliable for vessels equipped with radiocompass.

British Endorsement

The following is quoted from a letter of Captain Charles A. Bartlett, general marine superintendent of the White Star Line:

During my passage in the Olympic I was pleased to note the most useful method of the United States authorities in regard to radiobeacons fitted on Nantucket, Fire Island, and Ambrose Channel Light Vessels, and consider them a great and useful aid to navigation of steamers off the American coast. The usefulness of these beacons cannot be too strongly emphasized.

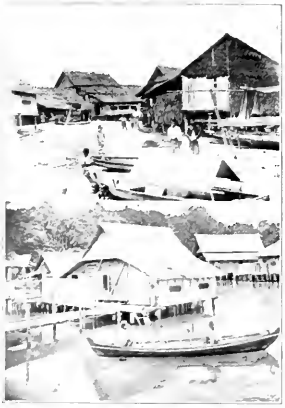
APOLOGIA

Our very humble apologies are due the "Ship's Bulletin" of the Standard Oil Company of New Jersey for the unpardonable, though inadvertent oversight, in our failure to give credit to that excellent fleet organ for the safety posters published on page 185 in the March issue and on page 291 in the May issue; and for the articles on Charter Party on page 214 in April issue and for that on the Zeuner Valve Diagram on page 269 of the May issue.

OLD COPIES WANTED

We have requests on file for old copies of Pacific Marine Review as follows: March, 1922, individual copy; all of Vol. 1, 1904; all of Vol. 3, 1906; and all of Vol. 10, 1904, either as individual copies or as bound volumes; also copies of April, 1924.

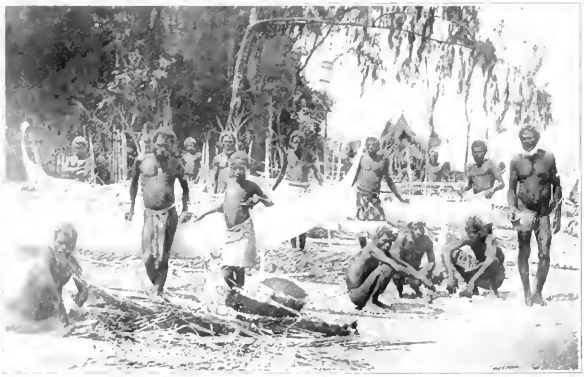
SOUTH PACIFIC SCENES



Fishing villages in Sumatra. Upper taken at low tide, lower at high tide.

PAPUAN MARINERS

Above is shown Papuan fishermen maneuvering the native fish net. At the right we have the Papuan "emergency fleet corporation" building war canoes in preparation for a raid. Note the simplicity of the equipment. It was not necessary to erect gum-poles, scaffolding, tracks or traveling cranes before obtaining this contract. According to our informant, there is no inspection system. These long war canoes are carved out of a single log, the only additional parts of the hull being the long ornaments at the bow and stern, and the outriggers and the outrigger pole. Some famous historical voyages have been made in these craft, some of them exceeding in length those of Christopher Columbus.



A PAPUAN TRIAL TRIP

The picturesque view at the left shows the fleet starting on its first trial with much ceremony. The data taken on this trip does not concern itself with fuel consumption per indicated horsepower, propeller efficiency, or water rate, but let any faults develop in the structure of the hull or in the balance of the craft and the "emergency fleet corporation" of Papua will find the climate exceedingly unhealthy.

It is not at all likely that the gum-shoe statesmen of Dutch New Guinea will be inquiring into the number of cowrie shells paid per ton for these vessels or that any chief's reputation will suffer.

TRADE AND TRAFFIC TRENDS

A Department Devoted to the Interests of Exporters, Importers, and All Ocean Shippers

RECENT DEVELOPMENTS IN POSTAL SERVICE

By COLONEL PAUL HENDERSON
Second Assistant Postmaster General

IN an address before the Transportation Group at the Twelfth Annual Convention of the Chamber of Commerce of the United States at Cleveland, Ohio, May 7, 1924, Colonel Henderson pointed out that recent extraordinary development in the parcel post service had taxed to the utmost existing postal facilities. The following abstract gives the gist of this address, which is of particular interest to Pacific Coast business men.

Postoffices which just a few years ago were larger than they need be have become crowded to the point of saturation. Railway postal car organizations made up on a liberal basis for the business of just a few months ago have had to be increased not only as to the numbers of men but also as to the size of the cars to take care of the increased volume.

Parcel Post

Analyzing this increase develops the fact that parcel post and its rapid growth is more responsible for it than any other one contributing factor. By the very nature of its bulk, parcel post growth brings with it a very rapid absorption of facilities both on the trains and in the postoffices, whereas increased business being done in first-class mail, due to the relative size of the letter and package, does not reflect itself in the matter of train and postoffice space as does similar expansion in the parcels end of the business.

When the law was passed some eleven years ago, creating parcel post, there was, I am sure, in the minds of even the most far-seeing of its authors no thought that this service would grow to a point even approaching its present size. Those who were at that time responsible for postoffice management were in an embarrassing position. They had thrust upon them a new and entirely different business, and yet there were provided no funds with which they might procure additional facilities, so that they fell into the habit of handling parcel post much as other mail had been handled in the past. That habit was followed through and, except for the establishing of some sixty railway mail service terminals the country over, parcel post is still handled much as other mails are handled, both on the trains and in the postoffices, so that today, with parcel post over eleven years old, and with it having grown from nothing to a business with revenues approaching $150,000,000 and with a volume of approximately 1,300,000,000 packages a year, we find ourselves still handling parcel post in much the same way that the first package was handled eleven years ago.

Airplane Post

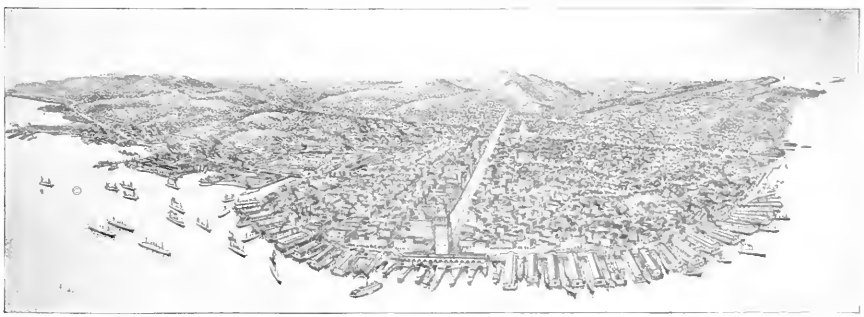
Feeling certain that the airplane must be operated at night as well as in the day time, last year we lighted an airway from Chicago, Illinois, to Cheyenne, Wyoming, approximately 1000 miles. This airway is provided with an automatic acetylene light every three miles; an emergency landing field with a revolving search-light type of electric light every twenty-five miles; and at intervals of approximately 250 miles are larger fields provided with revolving search-light beacons of 500,000,000 candle power, visible from 100 to 150 miles.

Last August as an experiment we operated for four days the service over this lighted airway in a continuous movement east from San Francisco to New York and west from New York to San Francisco each day. We were 100 per cent successful in this experiment, establishing an elapsed time record eastbound of 26 hours and 14 minutes and westbound of approximately 29 hours.

San Francisco-New York Service

We have recently been supplied by Congress with money enough to make this continuous movement service a regular thing after July 1, 1924, and it is now our purpose to start out on the first of July, or some date as near that as possible, flying from New York to San Francisco and from San Francisco to New York in a continuous movement each day in each direction.

I feel very optimistic as to our ability to maintain a schedule of about 30 hours each way, with practically the same regularity and efficiency that we have been able to maintain on our daylight operations for the last two years, namely, over 95 per cent.



The port and city of San Francisco as it meets the eye of the aerial port from New York and opens the gateway for American commerce to the Orient.

PROFIT IN EXPORTING

By HENRY M. MORSE

PRESUMABLY we are all in business for profit and we realize that to a very great extent our profit depends upon the volume of business that we can do at a low cost. For this reason exporting appeals to us because it gives us an opportunity to increase our volume and, under proper management, the cost of getting foreign business is fully as low as, and in many cases lower than, the cost of getting an equal amount of domestic business.

The orders frequently come in larger units from a smaller number of customers. This means less expense in connection with handling the orders in the factory and in credit investigations. The orders usualy come from a more carefully selected group of merchants than would domestic orders, reducing the credit risks.

Takes Care of Seasonal Fluctuations

The additional volume of business derived from the foreign markets added to our regular domestic business reduces the factory overhead. Foreign orders come at different times of the year from domestic orders. Christmas goods being shipped to a foreign country must be shipped early. Summer goods sold south of the equator are sold during the winter period and they are manufactured at the end of our summer season just when the demand in this country is the lightest.

The automobile people today get their foreign orders largely during the season when domestic orders are the lowest, and even though these constitute only 25 per cent of their total business, this is particularly precious, because it enables the factory to run without making goods that must be held until the domestic market opens.

This all means leveling of the peaks of demand, filling in the schedule of factory operation, and a lower production cost in the factory.

Unlimited Market Available

If we consider the entire world as our market, there is almost no limit to the quantity of goods that we can sell. Our exports in typewriters are 40 per cent of our total production; and yet typewriters can be used only in those countries that have reached a certain stage in their commercial and industrial development.

As intricate an appliance as the adding machine finds 25 per cent of its market in foreign countries; and in other lines that appeal to countries less advanced and of a lower purchasing power the demand is correspondingly greater.

AN APPEAL

This appeal, directed to the manufacturers of this country which should lead many of them into the export market, was made in an address delivered recently in Cleveland by Henry H. Morse, chief of the Domestic Commerce Division of the Department of Commerce.

He clearly demonstrates not only the advisability of this step upon the part of individuals, but also absolute necessity of it, if we are to continue as a factor in international commerce.

It is pointed out that the manufacturer is benefited by an increase of profits, gained through an extension in volume of sales which is almost unlimited because of an ever expanding market, and by a reduction in factory overhead costs effected through the leveling of peak demand and the filling of seasonal slumps. The manufacturer is in a better position to detect foreign competition and to improve his product in conformity with world-wide standards. He has a bulwark to fall back upon when the domestic market is temporarily depressed. He is performing a duty to his industry and to his nation since export trade stabilizes the industry, absorbing the surplus production and maintaining a price equilibrium. And it provides a means of payment to the international market for those commodities which we must import with those things which we can sell at a profit.

This does not mean that a manufacturer should attempt to enter all foreign markets at one time. In fact, this would be a mistake. His first step should be into those markets which will give him the quickest results together with the largest volume.

Once established in two or three markets of this type, the growth into other markets is natural, and when one considers the total population of the world and the constantly rising standard of living in some places that have not been regarded as good markets in the past, he will readily understand how the foreign field may be regarded as having a consuming power for the future beyond our conception.

Markets that years ago were buying nothing, today are importing cheap cotton textiles; markets that years ago were importing textiles and nothing else, today are buying shoes; and markets that years ago were buying shoes are now buying filing equipment and typewriters.

Means of Detecting Foreign Competition

There frequently is a value to export business quite distinct from the direct revenue and profit. Many a manufacturer has discovered his export business to be invaluable as a means of detecting foreign competition. An article that is selling readily in a given market may suddenly show a falling off in sales, and an investigation may show that the article has suddenly been called upon to compete with a new product which for some reason or other has captured the popular fancy.

The American manufacturer immediately exerts himself to meet that competition. He studies his chances; his product improves; he betters his methods; and puts himself on an equal footing with the dangerous competitor. This having happened in a foreign market prepares the manufacturer to compete with the same article in the domestic market later.

He is not caught unawares; his connections in the domestic market are not jeopardized and he avoids the loss of prestige and the loss of volume of sales that might result if the foreign competitor were suddenly encountered in the domestic market without an opportunity for preparation. It is much safer to fight a battle of this kind in a foreign market than to be forced to meet it at home.

Foreign Market Often Demands an Improved Product

There are many American manufacturers today who are putting up their products in lighter containers,

more attractive packages, or making the product itself in a different way from that in which it was originally put out because the custom requirements in a foreign country or the taste of the foreign customer has necessitated an improvement in the article as sold for foreign commerce, and the manufacturer has been quick to see the advantage that he would gain over his competitors in the domestic market by giving domestic customers the improved product that the export trade has demanded.

Safety Factor Against Depression at Home

There is a distinct safety factor in foreign trade against depression at home. Business depressions are seldom world-wide, and are usually due to local causes and are confined to one area or a very few areas at most. For this reason depressions may occur in this country when conditions abroad are very good. This has happened in the past and is likely to happen in the future.

At such times a manufacturer with established foreign markets can, when his competitors close down, keep his factory running, keep his organization intact, and give employment to his workers. And because his factory is operating when others are closed down he is in a position to accept such business in his line as may be offered no matter how much or little of it there may be. His position is much stronger than if his factory were closed.

Depressions Are Usually Limited in Their Scope

We are likely to undervalue this particular advantage of exporting because the last crisis through which we passed, that of 1920 and 1921, found the export market as flat as the domestic. This was due, as Governor Harding of the Federal Reserve Board pointed out when speaking in this city in 1921, to the fact that the condition was really a foreign depression following a world war, and what we were experiencing here was simply the effect of depression abroad. A situation of this sort would probably not occur again except in the event of another world war. Depressions are usually due to local causes and are local or the most national in their extent. They are seldom international.

Emergency Reserve When Domestic Collections Are Slow

During a panic year when money is tight and there is difficulty in making collections or in getting money with which to meet obligations, the exporting manufacturer who is shipping abroad and drawing drafts with a definite date of maturity can accurately forecast the receipt of proceeds of those drafts. He can regulate his expenditures to a large extent to conform to his receipts. He can plan his operations with a definite idea of how much money he will have available on a given date, and he need not either harass his domestic debtors for payments which they cannot make nor call upon his bankers for additional loans and extensions at a time when they are likely to be overcautious.

Stabilizes the Market

These benefits are all more or less individual, in that the principal beneficiary is a man who is actually doing the exporting, but there is a greater benefit to be derived by an industry as a whole—the stabilization of the market.

It is estimated that our exports are normally 10 per cent of our total business. If we should drop our export business and throw into our domestic market this additional 10 per cent, or even a small part of it, there would be a surplus big enough to demoralize the market seriously. It does not require a big surplus to cause a near-panic in an industry.

One manufacturer, or one large distributor, with more goods than he can dispose of at regular prices, can, by bidding for business at cut prices, shake the confidence of the industry and even of the public and practically prevent the sale of goods in the normal course of business.

This was fully illustrated in the fall of 1920, when, with a comparatively small surplus of shoes, shoe wholesalers and manufacturers in New England actually rented vacant stores and offered their goods to the public at less than factory cost. The public stopped buying shoes, because it was convinced that prices were going still lower, and under those conditions no wholesaler or retailer was willing to place an order beyond his limited, immediate demands.

Every time a manufacturer sells part of his output abroad, he not only increases his volume and his profits, but be likewise benefits his competitors and all the distributors for that line of goods, because he takes out of the market merchandise that might otherwise prove to be an unmarketable surplus.

National Necessity to Provide Means of Payment

Beyond all, this export trade is vital to the nation. There are many things which we need both in our industries and in our private life, which, because of our climate or some other reason, we cannot produce. Rubber, tin, coffee, spices, luxuries for the home, innumerable things must be purchased abroad if our industries are to be kept running and if we are to enjoy that plane of living to which our national prosperity entitles us.

These purchases must be paid for either with gold or with exports. We cannot pay out gold indefinitely and our exports must be of the visible type, since our invisible exports are almost negligible. Our investments in foreign securities are not comparable to those that brought wealth to the British Empire in the days before the war. We do not export labor as does Italy; we do not bring into the country large numbers of tourists as does Switzerland; we have not yet arrived at the point where we transport the world's goods in our ships as did Germany and England before the war; we do not collect a banker's toll on the international business or other countries as England does.

The Triangular Trade Principle

We must depend upon our exports for the money with which we will pay for the imports that are essential to our well being. It is not at all necessary that our trade with any individual country should balance. We do not need to send to Malaysia a large quantity of goods because our purchases there are heavy. We do not need to buy heavily from Argentina because we sell to that country. We do not need to buy Australian wheat and wood because that country buys our automobiles and player pianos. If we buy from Malaysia and sell to Australia, Malaysia will find a way to collect from Australia.

Practical Economics With Profit

International trade is truly international and our only concern need be that we put into the world hopper the equivalent in merchandise of the services and merchandise that we take out. By doing this we can continue to buy rubber for our tire factories, manganese for our steel, coffee for our breakfast table, luxuries for our home, and we can pay for them with automobiles, textiles, office appliances, and a thousand other things we are able to make and sell in foreign markets at a profit.

RATE PROCEDURE OF STEAMSHIP CONFERENCES

THE United States Department of Commerce, Transportation Division, recently issued a pamphlet by E. S. Gregg, chief of the division. This pamphlet has considerable information of value to shippers. The following summary is compiled for the benefit of our readers.

Steamship lines enter into conferences for the purpose of stabilizing rates and of protecting large investment in ship and equipment over a period of years. Many shippers interested in obtaining adjustments on commodity rates or classifications have failed in their attempts through lack of knowledge of the mode of procedure of conferences; or have felt mistreated because they did not understand the problems of the ship operator. In order to get at first-hand knowledge of the methods used, the Transportation Division recently sent out to the leading conferences the following questionnaire:

1. How frequently does your conference, or a committee of it, meet to pass on applications for changes in rates or classification?
2. Are applications docketed and published as in the case of the consolidated classification of railroads?
3. Are there any specific forms to be used in presenting applications for adjustments in rates or classifications?
4. What are the main factors which influence your conference to make changes in rates or classification?
5. Does your conference permit shippers to be represented at the hearings?

Of the replies received, that of the Pacific Westbound Conference is characteristic and is given herewith in full:

1. The Pacific Westbound Conference is composed of all regular commercial steamship lines from the Pacific Coast having service to the Orient, and is divided into four districts, as follows: San Francisco, California; Portland, Oregon; Seattle, Washington; and Vancouver, British Columbia. For purpose of convenience they are again divided into a southern district and a northern district, California comprising the southern district and Portland, Seattle and Vancouver the northern district. Each district has its own district meetings, the southern district meeting whenever occasion requires, but the northern district holds meetings on the first Tuesday of every month. A general meeting of all districts is held either in California, Oregon, Washington or British Columbia on the third Monday of January, April, July and October to pass on applications for changes in rates or classification and other business.

2. Application for changes in rates are docketed and referred to the general rate committee of the conference for investigation, and after their report is received action is taken at the district meeting or the general conference meeting, but such applications are not published like the consolidated classification committee of the railroads.

3. Specific forms are used in presenting application for adjustment in rates.

4. When applications for changes in rates are received, consideration is given to value of commodity in dollars and cents, competition with foreign manufacture, durability of package, stowage, etc., and also an endeavor to build up local manufacture.

5. Occasionally shippers desire to be represented at our meetings and permission has been given them to do so, but the usual practice followed by this conference is for the interested parties, in addition to furnishing specific form, to advise the secretary personally of any other reason why a change is desired, after which the secretary will make a complete investigation and report his findings to the conference.

As a sample of form for application of readjustment of freight charges, we append herewith the form used by the Pacific Westbound Conference:

Date.....
File No.....

1. Name of commodity:
2. Present rate:
3. Proposed rate:
4. Uses:
5. How packed for shipment:
6. Weight and measurement of packages:
7. Number cubic feet per 2000 pounds gross weight:
8. Value per 100 pounds at point of production:
9. Estimated tonnage per year and principal period of movement:
10. Competition encountered (state location of competitors, prices which must be met, rail rates from points of production to the port of shipment, and the rail rates from points of origin to port of destination); also state what commodities compete with community in question:
11. State general reasons for change in present rate:

Publication of Rates

The Department of Commerce has often urged that ocean freight rates and other traffic information be published and distributed by the shipping companies, taking the stand that such information would often induce inland manufacturers to make campaigns for foreign sales.

It has also been urged that ocean carriers cooperate in establishing a more uniform classification of commodities and of packing requirements. It is stated that less than one-half dozen American steamship companies have published classification of commodities and rates, and that very little attention is being paid to packing requirements. From the point of view of the shipper, it is important that he know very approximately the rate in force on any commodity for which he is considering the foreign market. If he has to get a rate by mail or wire every time he wants to make an estimate, there will be numerous occasions on which he will not take the trouble to make the estimate.

A British commission, in 1909, examining into this same condition with regard to British shipping, strongly advised the publishing of the rates. Before the war German shipping companies very generally published tariffs and classifications with considerable benefit to themselves and to German foreign trade. There are more reasons why such practice would be beneficial in the United States, where such a large part of the manufacturing industries is located so far from seaports.

From the shipowner's point of view, however, this matter appears in a very different light, as is shown by the following statement from the testimony of a prominent American ship operator:

Steamship tariffs have become very formidable and are too intricate for the average shipper to deal with

intelligently. The steamship lines have no organization such as the railroads have for compiling, printing and distributing tariffs. If any one shipper is to be supplied with the tariffs they must all be so supplied on request. This would add very materially to the steamship companies' present cost in handling their tariffs; but this is not the most important feature.

Oversea ocean rates are not subject to statutory supervision. The steamship lines must have a free hand to meet competition which constantly arises, and they must be able to adjust rates from day to day, if necessary, to meet changing trade conditions. By the time that a tariff reaches a shipper the rates may already have been changed. To be of real value, therefore, shippers would have to be notified immediately by letter and often by telegram of these changes. Altogether, therefore, tariffs would be of but little real value to a large number of shippers and exporters. Furthermore, frequency of sailings of a steamship line is often more important than the rate, and among the many competitive services it will be a difficult matter for an inexperienced shipper to feel his way without some further guidance.

Under our transportation act railroad agents in the interior must secure ocean rates and space for shippers on application; at all important interior points as well as at the principal ports there are freight forwarders who make a specialty of knowing rates and soliciting exporters. In addition many of the steamship lines maintain interior offices at the principal traffic centers. Therefore the proper method exists today for informing the shippers of rates, sailings, and shipping conditions.

One of the difficulties often experienced is that the shipper does not give the necessary information when inquiring for ocean rates and space. It should be borne in mind that tariffs today cover a great variety of separate commodities and that rates often are different according to the packing. Shippers should therefore carefully indicate the commodities and packing, except in cases where the commodities are extremely well known; he should state the volume of the shipment and its approximate time of shipment, and he, of course, should give the proper foreign destination. Inquiries are received for rates which in some instances do not name the commodity at all, and in others do not disclose the foreign destination of the goods. This may not be the common thing, but it sufficiently illustrates that many shippers, particularly those new in the business, seem to have but little understanding of oversea transportation.

OCEAN SHIPPING[1]

A SHIPPING depression, like typhoid fever, must run its course. The crisis of the present one is passed, but the long convalescence has just started. The present surplus of tonnage over immediate trade requirements is a much larger percentage of the total than in any previous depression, and in addition there is a great exhaustion of productive processes in many countries.

Huge World Ship Surplus Remains

Nothing happened during the past year to change materially the underlying causes of low ocean rates and lower net earnings. The volume of overseas cargo for the world as a whole at the end of the year was approximately what it was at the beginning of the year; meanwhile the steam tonnage of the world further increased. Today there are approximately one-third more ships than in 1913, and these ships are competing for only three-fourths to four-fifths the amount of the cargo which moved in the earlier year. It is beside the point that many ships on the register today, such as iron vessels, those over twenty-five years old, and our own Lake type, are not fitted for commercial use. The world survey of the Department of Commerce showed 7,500,000 gross tons of steam vessels out of employment in the middle of the year 1923. This surplus continues to hang as a threatening cloud over the rate market.

Consequently the events of the year in shipping were not fundamental. The most widely discussed event, to use a paradox, did not happen at all. The American ship subsidy bill was passed by the House of Representatives on November 29, but failed to pass the Senate. In contrast, the year witnessed the completion of post-war subsidy legislation by France and Japan, in which there was a plain tendency away from general navigation bounties and toward the scheme of special aid to essential lines. The year was characterized by the continued increase in tonnage, the falling of rates, the decline in shipbuilding, the rapid increase in popularity of the motorship, a phenomenal development of German shipping, and the striking growth of our intercoastal trade through the Panama Canal.

Scarcity of Cargo Depresses Rates

The excess of world tonnage over requirements and the failure of overseas trade to increase in volume during the year had a depressing effect on rates. As is to be expected in a period of declining rates, it was a bad year for steamship conferences (rate agreements or understandings) and many disruptions and realignments took place. The outside competition to the various conferences was severe, and nearly every agreement affecting our ports was disrupted or had to be materially changed. In the Pacific trade several attempts at a formal agreement on rates failed, and rates are open. In the Caribbean the high rates maintained by the conference had finally to be cut, and agreement is not yet in sight. In the Atlantic the vigorous competition of a British line caused a break in the strong trans-Atlantic conference. These conditions can be expected when a scarcity of cargo intensifies the keen competition which always exists in shipping.

Trip charter rates, which can be taken as an index of the freight market in general, since approximately half of the total volume of overseas commerce is carried at such rates, fell from 121 per cent of the average for 1911-1913 in the first half of the year to 111 per cent in the third quarter and to 109 per cent in the fourth quarter. The following statement gives the special index number constructed by the Department of Commerce from the mean of high and low quotations on coal, wheat, lumber, rice, sugar, and nitrate over twelve world trade routes:

1911-1913	100 per cent
1919	384 per cent
1920	272 per cent
1921	160 per cent
1922 (first half)	121 per cent
1922 (third quarter)	111 per cent
1922 (fourth quarter)	109 per cent
1923 (first quarter)	110 per cent
1923 (second quarter)	109 per cent

(Continued on Page 33, Advertising Section)

[1] From Commerce Year Book, 1923

Pacific Marine Review

June

THE ISLAND OF LANAI

A New Development in the Pineapple Business of the Hawaiian Islands, Involving a New Port, a New City, and the Planting of Ten to Twelve Thousand Acres of Virgin Soil

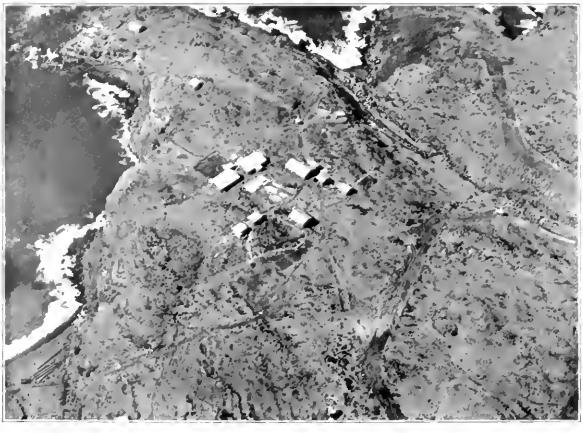
By JAMES D. DOLE
President, Hawaiian Pineapple Company

THE Island of Lanai is the sixth in size of the Hawaiian group, is located about fifty-five miles from Honolulu, the capital of the Territory on the Island of Oahu, and is separated from the Island of Maui by a channel about eight miles wide. It comprises about 90,000 acres, or 139 square miles, and is thus not quite one-fourth as large as the Island of Oahu. It is approximately 40 per cent larger than Mount Desert Island, Maine; it is about 40 per cent larger than Martha's Vineyard; it is almost exactly double the size of Staten Island and about two and one-half times the size of Catalina Island.

On the northeast side the coast line is protected by a coral reef, back of which there is a narrow rim of arable land. Above this the hills rise, culminating in a rather steep summit which registers the altitude of 3400 feet. On the southwest or lee side of the island the shore is rugged, there is little, if any, coral growth, and in places the cliffs rise abruptly from the ocean to a height of 1000 feet.

A little distance back from the southwest shore, hills flatten out into a plateau or series of level basins, the land looking more like the California valleys than any other areas of land in the Hawaiian Islands. These level lands, at an altitude of from 1000 to 1800 feet, comprise from 10,000 to 20,000 acres, and for perhaps fifteen years have from time to time been looked at with the idea that they might possibly some time come into cultivation for pineapples.

Aerial view of the new city on Lanai. Photo by 11th Photo Section, Air Service, U. S. A.



Aerial view of the port of Kaumalapau on the Island of Lanai. A breakwater 300 feet long is to be built from the point in the upper left-hand corner, making a sheltered cove for lighters or freighters. Photo by 11th Photo Section, Air Service, U. S. A.

The Island of Lanai has for many years been operated as a cattle ranch, the bulk of the island having been owned at one time by Walter Murray Gibson, prime minister of the Hawaiian Kingdom, later coming into the ownership of the late W. G. Irvin. Some fifteen or twenty years ago he sold it Charles Gay. Later it fell into the hands of a syndicate called the Lanai Company, Ltd., led by R. W. Shingle, J. T. McCrossen and the late Cecil Brown, who sold the island to Frank and Harry Baldwin of Maui, who retained control of it until December, 1922, when it was sold by them to the Hawaiian Pineapple Company, Ltd., for $1,100,000.

In the earlier years of its ranching history, the island was stocked with goats and sheep. The goats at one time reached an estimated total of 40,000 and did considerable injury to the native forest and watershed of the island, and during the regime of the Lanai Company and the Baldwins, a comprehensive attack was made on these goats. Many thousands were slaughtered and at the present time it is estimated that

A Hawaiian pineapple plantation on the Island of Oahu. Pineapples ready for harvesting.

there are less than 100 goats on the island, and a systematic attempt is being made to exterminate them to the last goat.

At one time the island carried many thousand sheep, but these were somewhat injurious to the soil on account of their close cropping of the grass and the cutting effect on the soil of their small hoofs. These have been reduced to a few hundred wild sheep and a few domestic sheep.

The island is carrying at present about 5500 head of cattle of a Hereford strain, but plans for the development of the island call for a considerable reduction.

The Hawaiian Pineapple Company proposes to gradually develop the pineapple areas and in this manner to increase its output of canned pineapple. It is the intention to transport all of the fresh fruit to its cannery in Honolulu. This presented the problem of selecting a suitable location on the Island of Lanai from which to ship fresh fruit in the ordinary lug-boxes or otherwise, and was somewhat a difficult problem.

There were no natural harbors which afforded sufficient protection. The windward side of the island presented opportunities for an artificial harbor to be cut behind the reef, with a channel to be dredged through the coral; but this side of the island is subject to rather severe winds and swells. Furthermore, it was inaccessible to the pineapple lands.

After considerable consultation, the services of F. B. ("Drydock") Smith of San Francisco were called upon. He made a thorough survey of the island and finally recommended that we develop the port of Kaumalapau, a small cove on the lee side of the island fully protected from the tradewinds, very convenient to the pineapple country, but open to southwesterly gales and westerly swells. Mr. Smith recommended the construction of a 300-foot breakwater, the deepening of the harbor in one corner, and the construction of a wharf. This work is now being carried out by the Hawaiian Dredging Company, Ltd., of Honolulu.

From this port to the pineapple lands an excellent road has been completed, the surfacing of which has just started. This road requires about four miles to reach the level uplands and extends another three miles to the townsite which is now being developed by the Hawaiian Pineapple Company as headquarters for its pineapple growing activities. This townsite is called Lanai City, and is being laid out with very comfortable quarters for the workmen. Streets, community hot water heaters, electric light and power plant, restaurant, store, baseball park, tennis courts, moving picture theater, hospital, offices, and bank will be built.

It is expected to plant about 400 acres of pineapples this fall in preparation for harvesting the first fruit in the summer of 1926.

The exact method of transporting the pineapples from Kaumalapau to Honolulu has not yet been settled upon, but it is expected that barges and towboats will be used, and it is possible that we way carry the pineapples in tanks of water, automatically floating them in and out.

Aerial view of the pineapple plantations on the [illegible] of the Island of Oa

SAILING ON SAN FRANCISCO BAY

By the Late JOHN RICHARDS

The late John Richards of San Francisco and San Anselmo was for many years a prominent consulting engineer and and technical editor in San Francisco. His hobby was the sail boat. The article reprinted here was written by him in 1890. Its observations are as pertinent today as they were then.

ACCIDENTS with sail boats on the Bay of San Francisco indicate, in most cases, an enormous stupidity on the part of those who own, hire and operate them. This stupidity consists in great degree from a supposition that anyone who has had some experience on the water can manage a sail boat here. This is a mistake. The faculty required, even where circumstances are favorable, is inborn, and not learned. It is that of holding constant attention on the management of a boat. The best sailors—that is, those who can sail a boat best—are just as likely to meet with an accident as a tyro if they lack the faculty of constant watching.

One can detect, in a few minutes' observation, the man or boy who will capsize a boat. The safe one is oblivious to all but his sails and tiller, he takes no part in conversation. If a steamer passes he scarcely sees it. His running tackle is all free at his feet, no "kinks" in it; he is taciturn and sour don't hear jokes, and only glances away from his charge to observe squalls on the water. When the boat is struck by a puff or squall he has "luffed" to meet it, or the sheet rope runs out unobserved.

The dangerous man, who is often a good sailor or one experienced in ship matters, engages in conversation. He points out places of interest, and is "one of a party"; managing his part as though it was a commonplace amusement, and turns the keel of his boat up to the sun.

People who have the faculty of watching a boat commonly know it themselves, but not always. To be caught a time or two is apt to warn one there is something wrong with their sailing faculty, and they have no right to take others out in a boat and endanger their lives. When one is to go out in a boat, the problem is not so much as to whether the person in charge is a sailor as it is, have they the "sailing faculty."

It requires years to learn the bay around San Francisco, not so much the water as the wind, which is torn up by promontories, cliffs and canons. It may blow in almost opposite directions within a distance of 100 yards. At certain hours, and with certain weather symptoms, it is safe to go one place, and not safe in another. The currents, too, are a patch work, following tortuous channels impinging here and there with vast whirlpools on one or both sides. There is no constancy in these currents. They vary with the height of the tide, the volume of water coming from the rivers, the wind, and sometimes without any discernible cause whatever.

The height of waves and their violence depend on whether the wind is with or against the currents, also on the pendulous or vibrating motion caused by obstructing spits, buried rocks, or velocity. Every few hours all this is changed, so that it becomes the work of years to "learn the bay," as it is called.

The best boats for practical purposes here are small ones, strongly built, not more than twenty feet long, that can be sailed by one man. The cat boat, or plunger rig, is best, because a gib "bags" in the wind like a lug sail, and will not fall off when struck by a squall, besides two sheet ropes cannot be safely handled in a small boat. All running gear should be free beyond possibility of mistake, and for summer the amount of canvas should be at least a third less than for winter, and half as much as can be carried where there is a low shore line and steady wind, as on the Atlantic Coast.

A gaff sail is preferable for one reason. It yields at the peak, and is that far elastic, but on the other hand must have less area, because there is more of the spread above, or the sail is higher. The triangular, or "leg of mutton," sail is, perhaps, best of all, especially if there is a short metal gaff, of twelve inches or so in length, that will, by its gravity, bring a sail down quickly when the halyard is let go.

In respect to provision against danger, it is not safe to carry ballast not counterbalanced by buoys of some kind—in other words, no boat should sink if capsized. This should be a rule in all cases, and boats should have an open rail around the gunwale so that if capsized there will be a means of hanging on. One can stick his toes into or under a deck rail, and then lay over a capsized boat, but cannot hang to a slippery bottom with his hands alone.

Another safeguard in sailing small boats is an elastic sheet rope. This, so far as known, is an invention of the writer, and is almost complete security against squalls, besides permitting a boat to work much better in rough water. It consists in placing in the sheet rope a spring of India rubber, or coiled wire, which is better, that will extend from two to three feet under all the sail will stand. The effect of one of these sheet springs is marvelous, a boat handles in a totally different manner. The comfort and ease of handling is quite enough to warrant the use of the device on all pleasure boats, while the safety from capsizing by squalls is almost insured.

The true boat for San Francisco Bay is a Swedish one, developed by thousands of years' experience under the same conditions that exist here—that is, bluff headlands, broken winds and squalls. They are queer looking craft, and would be refused entry in the clubs here, because of their unsymmetrical appearance and general uncouthness. They are commonly about two and a half "beams" in length, of oak and lapstrake built, so as to give great strength. The typical Swedish boat is fastened with wooden pins, and nearly all parts are varnished with Stockholm tar, a kind of pitch resembling rosin, and very suitable for the purposes. Dutch galliots are sometimes finished in the same manner.

PORTS OF THE PACIFIC

IMPROVEMENTS
DEVELOPMENTS
ACTIVITIES

SHANGHAI—A WORLD PORT

THE remarkable development of Pacific Ocean shipping is rapidly bringing into prominence the relative importance of Pacific Ocean ports as world ports and their probable future development. The Chinese Bureau of Economic Research in its monthly bulletin points out the necessity for increasing port and harbor equipment to meet the growing trade. Harbors were previously not subject to the rigorous competition that now prevails over the important sea routes; but nowadays competition, increased size of liners and advanced cost of shipping necessitate a reduction in the number of calls, and therefore a concentration of the business of shipping at fewer points. This means that harbors are continually being supplanted by better equipped rivals, which prosper at the expense of those that cannot cope with the demands now made upon them, or cannot attract the trade necessary for modern shipping calls. In addition to this concentration of the traffic formerly spread among several ports, the gradual increase in world trade and the increased size of shipping demand accommodation on the part of world ports that twenty years ago could scarcely have been foretold.

In trying to envisage future prospects of these selected world ports, there are four points that have to be considered. First, the position of the port has to be borne in mind; second, the trade possibilities of the area it dominates; third, the factor of a more intense process of elimination; and fourth, the condition of the harbor in view of increased shipping requirements.

Shanghai is already in the front rank of world ports. From the point of view of world position, it has no equal, being about equidistant in shipping time from Western Europe and the eastern part of the United States, the world's most developed industrial centers.

Shanghai Among First Five

At the present time Shanghai ranks in tonnage among the first five or six ports of the world, possibly as high as third or fourth. Exact comparison is difficult because of different methods in estimating at various ports.

In 1921 the clearances from the Port of Shanghai amounted to 24,082,276 tons; in 1922 the clearances totaled 27,500,000 tons. If this rate of increase maintains, it is feasible to suppose that it will equal Liverpool, Antwerp, and even New York, within a few years.

Serves Over Two Hundred Millions

Shanghai has a bigger geographical area to serve and a more important economic hinterland than any other port in Asia. On the land side it is the outlet of, and the inlet to, the vast stretch of the Yangtze watershed, which holds close on 200 million people, or four times the population of England and nearly half that of the whole of the British Empire.

What are the trade possibilities of the Yangtze valley? This is a fundamental inquiry in assessing Shanghai's future. The future of the Yangtze is the future of economic China, and it is now commonplace to say that the 200 million people who inhabit the Yangtze region have a vital influence on the economic future of the entire world. Post-war days have given evidence of the growing consciousness of this truth in western countries. As yet, however, the purchasing power of these 200 million people is not equivalent to, say, the purchasing power of Australia, with a population of only five million. In fact, Australia, with one-fortieth of the population of Central China, imports goods valued at $96,000,000 more than the whole of the Yangtze valley. Roughly, the figures are: Australia, $480,000,000; Yangtze valley, $384,000,000.

But this shows potential purchasing power, if not actual purchasing power. The standard of living of the Chinese is going up by leaps and bounds, and the intensification of the industrial life on the Yangtze valley is assuredly proof that in years to come its population will be making as keen demands on foreign markets as the people of any other country.

Demands Constantly Growing

A comparison of the enumerated articles listed by the Maritime Customs a decade ago with those of the current year shows that the Chinese are demanding from foreign markets more and more commodities that were formerly foreign to their taste and that have

A seagoing junk. Much of the coastal and river commerce of China is still handled in this type of craft.

gradually evolved out of experiments which made luxuries into necessities, due partly to the economic improvement of the people and partly to the keen desire of present-day Chinese to share in the cosmopolitan fruits of modern invention and industry.

In the meantime an important feature of China's import requirements will be machinery and materials, the output of which in western countries is increasing steadily. Industrial plants of all descriptions, motor cars and trucks, agricultural machinery, locomotives and rails, traction and road engines, all kinds of iron and steel manufactures, building and electrical materials—all these are wanted in the new China. They will be called for to an ever increasing extent for many years to come. The potentialities of the market may be appreciated from the following figures of imports showing growth over a ten-year period:

Machinery	1912 Hk. Tls.	1922 Hk. Tls.
Agricultural	61,727	695,732
Propelling (boilers, turbines, etc.)	566,392	2,395,490
Textile	544,966	30,480,376
Brewing, sugar refining, etc.	32,771	268,809
Other kinds and machine parts	2,182,597	15,583,016
Machine tools	19,629	634,369

Exchange of goods between the Yangtze valley and the outer world will proceed at a steadily increasing rate. Central China has much in the way of raw materials to replenish diminishing world stocks of stable commodities.

The possibilities of the hinterland of Shanghai having been emphasized, the condition of the port itself might be inquired into. As an industrial center it is also preeminent. Here a majority of the industrial establishments in China are situated, and over 75 per cent of the cotton mills.

The central position of Shanghai makes it particularly favorable for industries whose raw materials have to be brought together from distant points. Shanghai gives the least trouble to the manufacturer in the handling of his finished article. It is situated in a position to command a steady supply of the basic and raw materials necessary to industry. Plenty of easily obtained coal is contained in the Yangtze provinces of Hunan and Kiangsi. Coal is transported from Chihli province and Japan. Iron comes from Hupeh province, 600 miles up the Yangtze river.

Contemplated Improvements

In 1919 the Whangpoo Conservancy Board undertook a full and comprehensive investigation into all the technical factors and possibilities of improving Shanghai as a first-class port. This investigation was carried out from 1919 to 1921, and the result of the board's investigation was submitted to a committee of well-known consulting engineers, whose duty it was to formulate the best general scheme for the development of the port (a) with approaches as they are and (b) for the probable maximum draft on the Pacific. In the preamble of the report this committee laid it down that "the time has arrived when the approach must be developed into a first-class waterway." Not only should "the navigable channels be made to conform to the requirements of modern vessels, but many other improvements are equally essential. Additional and deeper wharf frontage, more godowns for the storing of goods, more effective means for the handling and transshipment of cargo, and the extension of the harbor limits to permit of adequate control, are all necessary to the trade of the future and for reducing the cost of dealing with the trade." Already much improvement has been effected by the Whangpoo Conservancy Board. Their maps now show a through channel depth of thirty feet at lowest low water in the reach of the Whangpoo mouth. This is a record depth, as will be seen from the following table, giving the depth in the channel at lowest low water in the reach, where formerly the Woosung outer bar was: 1858, 19 feet; 1871, 24 feet; 1900, 13 feet; 1906 (immediately before start of Conservancy work), 15 feet; 1910-12 (on completion of Shanghai side breakwater), 21 feet; 1914 (on completion of Pootung side breakwater), 27 feet; 1920, 29 feet, and 1923, 30 feet.

But, as the report of the consulting engineers suggests, more should be done, and the scope of the work is too big and the authority involved too comprehensive for the present machinery afforded by the constitution and facilities of the board.

It is understood that the Chinese government has the report of the consulting engineers, made in 1921, under serious consideration at present.

Importance of Pacific

Equipped with the resources of a world port, having at its disposal the best in China for the handling of merchandise, and standing at the door of one of the richest hinterlands in the world, Shanghai would seem to be potentially the most important port in eastern Asia for both eastern and western traffic for many years. But there are other factors to bear in mind before one can assure to Shanghai such a commanding position. It is the opinion of the world's shippers, the passing of the war removed the political and economic as well as others with an economic turn of mind, that nomic center of gravitation from the Atlantic to the Pacific. It has been said, "Europe will sink into unimportance and the Pacific Ocean will become the chief area of events in the world's great hereafter." If this seems too extravagant a statement there will be no difficulty in gaining general acceptance to the opinion expressed long ago by Theodore Roosevelt that America's future lies on the Pacific.

LUMBER SHIPMENTS FROM PORTLAND 1923.

January												$ 194,500
February												149,500
March												57,000
April												251,570
May												255,000
June												263,688
July												311,003
August												342,000
September												472,000
October												366,180
November												434,246
December												246,500
Total												$3,947,654
Total 1922												$1,149,192

LUMBER SHIPMENTS FROM COLUMBIA RIVER.

January												$ 411,000
February												149,500
March												57,000
April												159,000
May												255,000
June												238,000
July												712,024
August												508,169
September												731,192
October												932,050
November												684,200
December												491,000
Total												$5,470,135
Total 1922												$1,149,192

* Piers.

Statistics compiled by [illegible].

PACIFIC COAST PORT NOTES

Ports of Washington

Seattle. An announcement, which was heralded by the citizens of Seattle as the greatest development in the shipping and industrial life of Seattle since the city became a world port, was reecntly made by the Pacific Steamship Company that the plans and financial arrangements for its new shipping terminal were complete and that work on the first unit would start immediately.

The site, as announced before in these columns, is that of the old Skinner & Eddy Plant No. 1, extending from Massachusetts street to Connecticut street, and is virtually in the industrial heart of the city.

The shed of the first unit of the new terminals will be 1100 feet long and 153 feet wide, with a slip 1179 feet in length. The piers and warehouses will be built of steel and concrete, fireproof, and of the most modern type in any port in the world. Eventually three large piers, warehouses of large capacity, and an office building where the general offices of the company and operating and traffic forces can be housed, will be constructed. The three piers now on the property will not be disturbed. The cost of the new terminal is estimated at $4,000,000.

Plans to form a Puget Sound port district, including Seattle, Tacoma and Everett, have again been under discussion. It has been contended that a coordination of terminal facilities will cut down a great deal of unnecessary competition and expense to shippers in switching charges.

Tacoma exports for February show a gain of 50,000 tons over the same month of 1923, the total for February, 1924, being 159,648 tons. During that month 54,952,382 feet of lumber were taken from Tacoma. Of this amount 26,208,771 feet went to foreign users. There were 151,451 barrels of flour shipped out of this port during February.

Kelso. In his report submitted to the Kelso port commissioners the early part of May, W. J. Roberts, engineer for the district, recommended the development of a 40-acre site at the foot of Oregon Way, Longview, in preference to the Carrolton channel site. The estimated cost of the site and development of facilities is $341,795. The port district this fall will be able to raise $550,000 by a bond issue. The matter of establishing this terminal is being considered by the Port Commission.

Ports of Oregon

The United States Army Engineers are now working in the channel of Yaquima Bay at Newport, where the river enters the ocean. Surface blasts will be used to remove the heavy rock. Charges of 500 to 1000 pounds, consisting of 90 per cent blasting gelatine, will be placed on a convenient ledge by divers and fired by electricity. While the currents are expected to carry away most of the loosened rock, a dredge will follow the work next year and clean out what the charges have torn away. It is hoped to secure a uniform depth of 17 feet at low water, and that in another year or two the channel will be cleared to a depth of 20 feet for a width of 400 feet.

Improvements of the channel of the Columbia river from Vancouver, Washington, to the mouth of the Willamette river will be provided for in the House Rivers and Harbors Bill. The city of Vancouver will expend $123,000 on the improvement, and the channel will be maintained by the government at an annual expense of $18,000.

The Columbia river diking work is practically completed for this year. Four dikes were built at St. Helens and an old one reinforced, one new dike was built at Martin's Island, two new ones at Kalama, and four at Doublebower. Practically all of these dikes extend from the shore transversely into the stream and are designed to confine the current and make it scour the channel, thus minimizing the amount of dredging which must be done each year. Because of works of this character, the extent of dredging necessary in the Columbia river is becoming less each year, and many more dikes are contemplated for channel control between St. Helens and the sea.

The **Port of Portland** Commission has served notice that it will take court action where cooperation is not forthcoming from dock owners in building bulkheads to prevent sediment from sloughing back into the channel. Owners of eighteen important docks and the Commission of Public Docks have agreed to cooperate on the proposition. The Port of Portland Commission is working to establish a harbor line depth of 35 feet, which has been impossible due to the condition of many of the dock fronts. Bulkheading will also be required on vacant property in some instances.

Portland's Merchants Exchange, Traffic Bureau, reports exports of all commodities from Portland for April amounted to $3,188,076, exceeding exports for the corresponding month of 1923 by a half million dollars. The principal commodities shipped out of Portland are lumber, wheat and flour.

St. Helens has recently been improved by the completion of the dock and warehouse of the Columbia River Packers' Association. The structure contains the office of the organization, ice house, supply house, net loft, sleeping quarters for fishing crew, and all necessary gear for the rapid handling of fish.

Astoria. The establishment by the Standard Oil Company of California of a ship fueling station at Astoria has been assured by the agreement of company and Port of Astoria officials upon the terms of a contract for leasing a tract of port property.

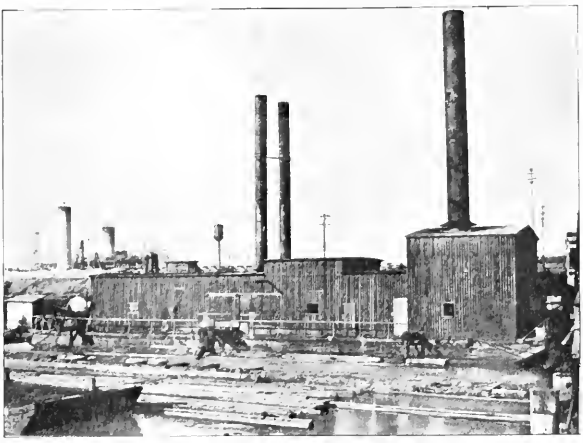
The plans for the plant, so far as they have been made public, provide for the expenditure of more than $1,000,000 within a year.

The terms of the contract provide that port leases of a tract of five acre acres of property in immediate connection with Pier 3 of the marine terminal system to the Standard Oil Company for 25 years at a monthly rental of $75. In addition, the company is given an option on an additional five acres joining the tract. While no announcement has been made, it is reliably reported that the company plans to exercise this option at once and to construct its plant on the entire ten acres.

The plans call for the erection of oil storage tanks immediately and for the laying of pipelines from each of the three port piers. The company will pay $50 monthly for the privilege of laying these pipelines. The pipelines will be so arranged that vessels can be bunkered while handling cargo without shifting or loss of time.

In addition to the monthly rentals the Standard Oil Company will pay tolls to the port on each ton of oil handled in either direction, either through the pipelines or over the docks. The toll on fuel oil will be 5 cents per long ton; on refined oil, 15 cents per long ton, and on case oil 25 cents per short ton.

While the plant will be establish-



AN INTERESTING FLOATING POWER PLANT

This 1500-kilowatt, 440-volt Allis-Chalmers turbo-generator and a battery of oil-fired locomotive type boilers installed on a 500-ton barge, complete with barometric condenser, circulating and dry vacuum pumps and all necessary piping are used as a temporary electric power plant at the river port of Longview, which is now being developed on a tremendous scale on the Washington bank of the lower Columbia by the Long-Bell Lumber Company.

ed primarily for the fueling of ocean vessels, the officials who negotiated the contract with the port commission stated that it is the company's plan to expand the plant into a general distribution center for oil and oil products, which will be shipped from Astoria by river steamer and rail.

The development of the station is expected to prove of great value to the Port of Astoria in the matter of increasing tonnage, as it is expected that large amounts of freight, particularly small parcels, will be shipped to Astoria because of the proximity of the station to the sea and the fact that vessels can secure fuel as well as freight with a minimum loss of time.

While the lumber business over the country generally is considered slack, the cargo shipments of lumber from the Columbia river during the month of April equalled the record of 93,000,000 set last August as the great single month's shipment of lumber in the history of the port.

The April lumber trade was featured by a slight strengthening of the foreign trade and by an unusual boom in the intercoastal movement. The California trade remained slack The shipments of the month were divided almost equally between the east coast, California and foreign ports.

California Ports

San Francisco. At a meeting of the Pacific Traffic Association held in San Francisco April 29, Mr. Cantilow of the Luckenbach Lines made a statement that twenty-three years ago, namely 1901, he had sat in an office in San Francisco and single-handed booked all the freight by water out of this port to China, Mexico, Central and South America; and he asked the traffic men there present to visualize the progress that had been made during the twenty-three years past and then to try to look forward and visualize the proportionate progress of the next twenty-three years and so get an idea of what it might be necessary to do to prepare the San Francisco waterfront equipment to take care of such business.

Charles H. Spear, chairman of the California State Board of Harbor Commissioners, in emphasizing the necessity for more pier equipment, stated that in the month of February, 1924, which is usually a slow month, 728 offshore, coastwise and intercoastal vessels had entered or cleared from the San Francisco waterfront, which is a little better than one vessel an hour for the month. He cited many specific problems of congestion as showing the need for new construction of piers. He also cited the need for cooperation between and coordination of the various draying companies, so as to prevent the congestion of trucks on the piers in greater numbers than are necessary for the movement of freight.

All of this is part of an educative campaign on the part of the Harbor Board to teach merchants, shippers, steamship operators, railway executives and traffic men the necessity for agreeing on some method of getting larger returns from the operation of the harbor, in order to take care of greater bonds issued for future developments. Since the present tariffs in the port of San Francisco are lower than those of any comparable port in the country by a very wide margin, and since the State Harbor Board has complete authority for making changes in the rates, this attitude of carrying on an educative drive previous to action in this matter is to be highly commended.

In his talk Mr. Spear brought out the importance of its port to the city of San Francisco inasmuch as shipping is the premier industry of this city. Figures of a nature compiled for the first time indicate that the port excels any other San Francisco business or industry in the amount of money it puts into circulation. These show:

That shipping put $83,032,000 into circulation here during the past year.

That this sum resulted from the operation in and out of the port of 5760 vessels of all classes, excluding 840 tankers.

That the port distributed its $83,032,000 business through the following channels: Rentals of offices, piers and terminals; wharf charges and cargo tolls; towage, barging, trucking and stevedoring; clerk hire, payrolls, repairs and supplies.

Four harbor development projects involving an expenditure of several million dollars are now being carried on by the Federal government in San Francisco Bay and its tributaries. Briefly these are:

1. San Francisco outer harbor. Deepening the bar over the main channel of Golden Gate from a depth of 35 feet to 40 feet, 2000 feet wide (strong pressure is also being used to induce the government to make this channel 50 feet deep).

2. Oakland inner harbor. Dredging out the channel 6000 feet from the mouth of Oakland creek up to Webster street in 1924 and extending it to Brooklyn basin after the Oakland-Alameda tube is completed in 1926.

3. Richmond. A 24-foot channel to the municipal wharf and inner harbor and a turning basin at Point Potrero, and a wall 1000 feet in length along the south side of the channel.

(Continued on Page 32, Adv. Sec.)

MARINE OIL ENGINE AND MOTORSHIP PROGRESS

RECENT MOTORSHIP DEVELOPMENTS

AMERICAN diesel engine manufacturers and American shipyards are still living in the hope that Congress will find enough time aside from investigations into the sale prices of obsolete steamers to give consideration to the Edmonds Bill, providing a $25,000,000 loan fund for the dieselization of steam tonnage. It is interesting in this connection to note that Great Britain has, during the past year and a half, loaned between fifty and seventy million dollars at five per cent to British shipowners and builders for ship construction purposes and that this money has been used almost entirely in the financing of new motorship construction.

A very interesting paper was read before the Association of German Engineers by E. Goos, director of the Hamburg-America Line. This paper shows that the actual working costs of a motorship (allowing 15 per cent for interest, depreciation, and insurance), amounts to about 80 per cent of the operating cost for a steam vessel. It was pointed out that one of the most promising means of increasing over-all efficiency lies in the recovery of the heat in the exhaust gases, and it has been shown possible in practical experiments with simple heaters to raise 0.88 pounds of steam at 118 pounds pressure for every horsepower hour developed by the diesel engine. This very simple method effects a saving equal to about one-half the saving effected by the Still-diesel combination.

During May the British motorship Pacific Shipper of the Furness, Withy & Company line, arrived at San Francisco on her maiden voyage from United Kingdom ports. This vessel, as has been previously mentioned in these columns, is of 10,000 tons deadweight capacity and is equipped with one 3500 indicated horsepower 2-cycle opposed piston Doxford diesel engine of the same type as has previously been seen here in the Swedish motorship Yngaren. We are recently in receipt of a letter written by an engineer who was present on the trial trip of the Pacific Shipper and who describes in detail the arrangements for treating heavy oils before using in engines.

The oil used on the trial had a gravity of .8964, being what is known in England as first grade diesel oil. This is lifted by a transfer pump from the double bottom tanks to an overhead tank having a capacity of 4 tons and located with its bottom 12 feet above the center of the inlet tube of a No. 6 Sharples centrifuge. The 4-ton tank is fitted with a steam coil for heating, and the oil runs from it through a circular steam heater of pipe construction about 15 inches in diameter, arranged with flanges and covers both top and bottom. From this heater the oil runs by gravity into the centrifuge. The discharge from the centrifuge runs into a square receiving tank measuring 2 feet cubed. This tank is fitted with a ball float operating a throttle valve on the feed pipe to the centrifuge. From this tank, oil runs by gravity into a ½-ton capacity tank situated immediately beneath it, and from the ½-ton tank the oil gravitates again into a 2-ton capacity tank fitted with an Avery weighing machine of the oscillating bucket type. From the weighing machine tank the oil gravitates to the fuel pumps of the engine.

In preparation for the trial, the centrifuge was switched in about one hour before the main engines were started, the diesel oil having been previously heated to a temperature of 150 degrees Fahrenheit. The centrifuge was adjusted for a capacity of one ton an hour. The ball float in the first receiving tank then took control of the flow to machine, making the whole system automatic and fool-proof. One ton of oil was ready when the main engines were started.

For several hours in the morning the vessel cruised around at various speeds, testing steering gear, maneuvering ability and compass. In the afternoon, three runs were made for speed over the measured mile. On the last run 12½ knots an hour were averaged. As the ship was very light, there was considerable vibration at this overload on engines, so that there was a very thorough test of the action of the centrifuge, but it stood up manfully to the job, discharging clean oil continuously at the rate of one ton an hour.

After the trial the centrifuge was taken down and it was found that the bowl contained about 8 pounds of muck, consisting of emulsion in the form of a soft jelly filled with finely granulated gritty solid matter. In addition to this solid matter there was, during the run of four hours, a continuous discharge of water in drops of 2 or 3 every second, and occasionally in a small stream for 20 to 30 seconds. Time taken for stopping, cleaning, reassembling, and starting the centrifuge was exactly 10 minutes.

Piston and crosshead of the new Bethlehem diesel engine after removal from the cylinder.

THE HAMILTON DIESEL

The Hooven, Owens, Rentschler Co., of Hamilton, Ohio, Obtain Manufacturing License for the Famous M. A. N. Diesel Engine

IT is very significant to anyone interested in diesel development that Hooven, Owens, Rentschler Company have taken over the M. A. N. license and will build diesels exactly as they are built at Augsburg, Bavaria.

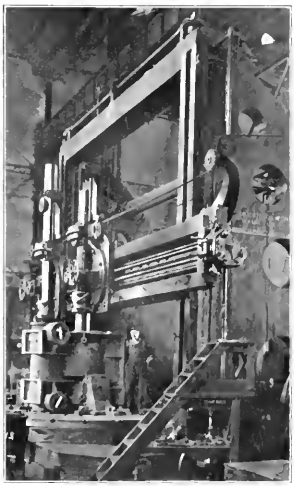
Maschinenfabrik Augsburg-Nurnberg A. G., popularly and universally known as M. A. N., are one of the largest builders of engines and machinery in the world. They employ about 15,500 men in their two plants. It was at the Augsburg plant that Dr. Diesel and Dr. Imanuel Lauster built the first diesel engine. Dr. Lauster is today the managing director of M. A. N.

From this single cylinder has evolved and grown the diesel as we know it today. M. A. N. have built more than a million diesel horsepower in a great range of sizes and embracing every basic system used: four-cycle single-acting, four-cylinder double-acting, two-cycle single-acting, and two-cycle double-acting.

Before 1900 some of the oldest and long-established firms recognized the wonderful future of the M. A. N. diesel, and secured licenses from Augsburg. These builders have since become world famous for their diesel work and deserve much credit for additional contributions to diesel development, but all pay tribute to M. A. N. as the place where the diesel was born and from whence most of the diesel knowledge has been given to the world.

Research

It is interesting to know that the laboratory instinct which prevailed at M. A. N. nearly thirty years ago,



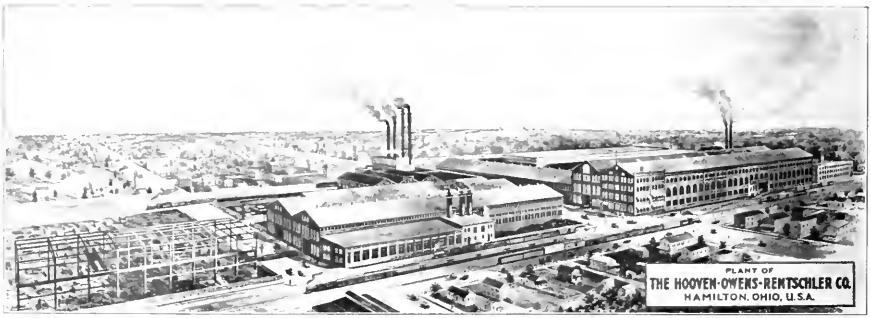
Engine cylinder being bored out on 20-foot boring mill.

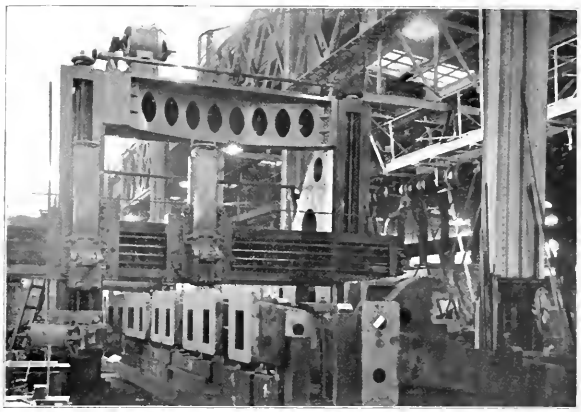
the looking ahead, the eternal search for the better — all these are still the guiding principles of M. A. N. Through the difficult initial stages of diesel building, the licensees encountered many problems and ran foul of big obstacles. These were referred to M. A. N. The problems were solved, the obstacles blasted from the path of progress, and the result of the intensive research work necessary enriched the store of diesel learning. Keen competition among manufacturers and shipping men in Europe, their demand for the greatest economies in power production, turned their minds to the diesel. This brought about a comparatively quick development of diesel building, and by 1908 diesel engines were being used in many industries.

The early work of M. A. N. led them to develop high-speed diesel motors of two and four cycle types for submarines. In 1914 these motors had reached a remarkable degree of reliability, which was demonstrated by the work of the German submarines. The M. A. N. four cycle submarine engine became the standard for the German Navy.

Double-Acting Two-Cycle

Prior to the outbreak of the war, M. A. N. had made some notable land installations of substantial horsepower. They had also produced a double-acting two-cycle motor for a seagoing vessel. At the invitation of the German Admiralty, M. A. N. built a 12,000-horsepower diesel, eight cylinders, two cycle, double acting. This was finished and passed the rigid Admiralty requirements when the armistice came. This is by far the largest diesel ever completed. M. A. N. are still keenly alive to the further possibilities of the diesel. In their large experimental department all types of diesel cylinders are being made and tested. The latest development, a 1550 horsepower cylinder of the two-cycle double-acting type, has been running on the test stand for several months. This engine, a unit for large power requirement, probably represents the highest point in diesel development today.





Hamilton Investigation

The choice of M. A. N. by Hooven, Owens, Rentschler was made after years of investigation and a great deal of experimental work of their own. Their engineers went to Europe twice and visited practically every plant of note where diesels were built. From all their study came the conviction that M. A. N. had the diesel they should build and M. A. N. had the men, knowledge and equipment that promised most for the future.

It is a fitting connection. Hooven, Owens, Rentschler are old steam-engine builders. They were established in Hamilton, Ohio, in 1845. Previous to the war they had built many big installations such as Ford's 60,000-horsepower plant in Detroit. There are more than 5000 Hamilton steam engines in the United States.

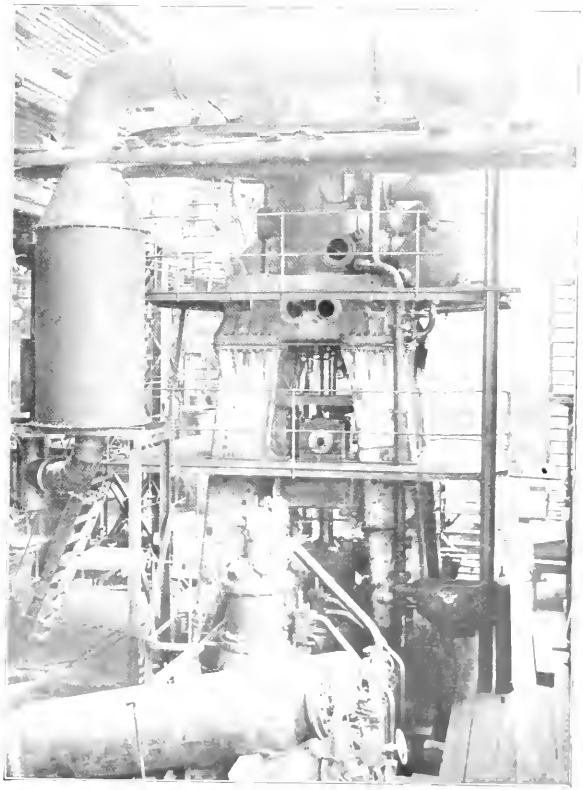
Perhaps Hamilton's most remarkable achievement was the building of four 2800-horsepower marine engines a week for the Emergency Fleet Corporation. On this job alone they built ninety-two 2800 horsepower, seven of 1400 horsepower, and forty of 750 horsepower.

The range of sizes developed for marine purposes is from 750 horsepower to 5000 horsepower. The Glasgow Herald returns for 1921 reported that Hooven, Owens, Rentschler had built more horsepower of steam marine engines than any plant or shipyard in the world. In the one size, 3200 horsepower, they built nineteen engines for the tankers of the Standard Oil Company, the Texas Company, and other oil companies.

Another interesting Hamilton engine is the 4000 horsepower quadruple engine for the Southern Pacific Company's 16,000-ton tanker Tamiahua. The total horsepower of Hamilton marine engines to date is more than 400,000.

With this background of experience with their foundries, shops, big modern tools and equipment, with the M. A. N. license and, best of all, with Hamilton engineers on the job, it is safe to predict that the Hamilton M. A. N. diesel will be worthy of both. It means that Hamilton will be able to build diesel engines of any size for American shipping and American industry.

At left view in the Hooven, Owens, Rentschler Company's shop showing gang of engine frames on a planer. Below view in the shops of the M. A. N. showing single-cylinder double-acting two-cycle diesel which has developed up to 1350 horsepower. It is claimed that with this type marine plants can be constructed with a weight per horsepower of 136 pounds.



A NEW DIESEL-ELECTRIC YACHT

Winton-Westinghouse Equipment Installed on A.W. Smith's Auxiliary Schooner Yacht Cutty Sark

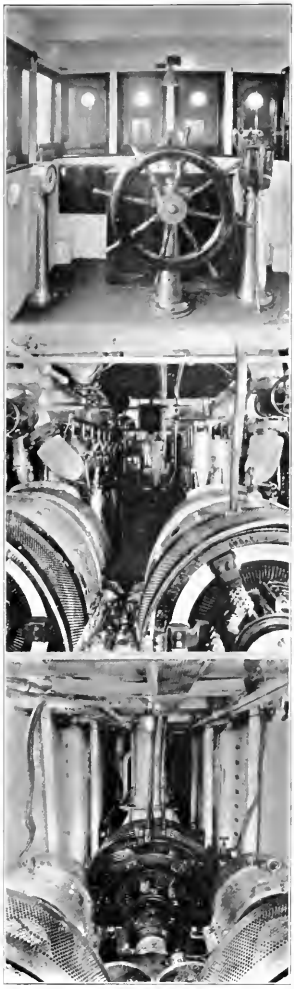
By H. C. COLEMAN
Marine Engineer, Westinghouse Electric & Manufacturing Company

OWNERS of yachts have for some time realized the many advantages of using electrical appliances, in a small way, on their vessels. The number and variety of applications have gradually increased until within the last three years this development has extended to the propelling machinery so that we now have complete electrically equipped craft thoroughly modern in every way. The propelling machinery of these new yachts is of the diesel-electric type, consisting of medium or small diesel engines driving electric generators which supply power to a propelling motor. The engines rotate always in one direction of rotation and at full speed rated while the propeller speed and direction of rotation are controlled electrically through the propelling motor.

The latest vessel to be fitted with this type of propulsion is the Cutty Sark, formerly the Ariadne, an auxiliary schooner yacht owned by A. W. Smith of New York. The work of installing her new machinery was recently completed at the yard of the Morse Dry Dock Company, Brooklyn. She is 131 feet long, 26 feet beam, and has a gross tonnage of 246 and draft of 19 feet.

This yacht is equipped with two main generating sets, each consisting of a 100 brake horse power, 6-cylinder Winton full diesel engine, direct connected to a 65-kilowatt, 125-volt, 600 r. p. m. Westinghouse generator and a 7-kilowatt, 125-volt exciter, a 150-horse power, 250-volt, 240 r. p. m. Westinghouse propelling motor; and complete control equipment.

As will be seen from the illustrations, the generating sets are very small and compact and lend themselves very well to installation in the engine room of such vessels where the space is limited by the fine lines and by the necessity of obtaining as much space as possible for quarters. The generator, exciter and pedestal bearings are specially arranged for mounting on an extension of the rigid engine base, thus providing a self-contained unit which maintains its alignment and which is easy to place and secure to the ship's structure. The exciter armature is pressed on an extension of the main generator shaft and the outboard bearing for the latter is made sufficiently large to support the overhung exciter armature. This eliminates the necessity for an outboard bearing on the exciter and so makes a shorter unit.



Top, pilot house of the Cutty Sark, showing control. Center, engine room of Cutty Sark, looking forward between the two Winton-Westinghouse electric generating sets. Bottom, engine room of Cutty Sark, looking aft between the two exciters at the propelling motor.

The propelling motor is of the single unit type. The supporting feet are arranged as near the horizontal center line of the field frame as possible in order to fit the frame down into the hull, which is very restricted at this point. The armature is carried in two short pedestal bearings which are supported on cross members secured to the ship's framing. The terminals on the motor, as well as on generators and exciters, are arranged at the tops of the field frames and the cables are led directly up to the deck above, along the under sides of which they are carried forward to the switchboard.

Both the propulsion and the auxiliary switchboard are located in the control room, which is directly above the forward end of the engine room. The propulsion board is mounted in the forward end of this room and carries the control equipment for the main generator, exciters, and propelling motor. The well known Ward Leonard control system is used. The two generator armatures are connected in series to the propelling motor armature, through a main line magnetic contactor by means of double throw knife switches, as shown on the accompanying main circuit diagram. The motor shunt field is separately excited at a constant value from the excitation bus, which may be supplied by either exciter. The generator shunt fields are connected in parallel to the reversing rheostat, which is supplied with power from the excitation bus. This rheostat, which might be called the master controller, is of the double face plate type so constructed and arranged that with the contact arms in the neutral position, no voltage is impressed on the generator fields. When the arms are moved in one direction, voltage is applied to the fields in thirty steps from zero to full voltage in one direction. When the arms are moved the opposite way from the neutral position, the polarity is reversed and voltage again gradually applied. Thus the

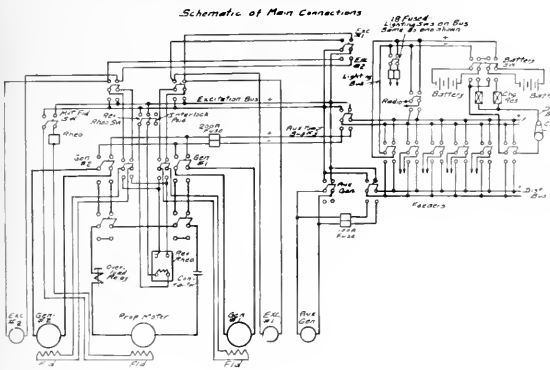


Diagram of main circuit connections for the control of the diesel-electric propelling machinery on the yacht Cutty Sark.

generator voltage is varied in direction and intensity by this rheostat and since the motor field is separately excited at a constant value, its speed will vary in direct proportion to the generator voltage, neglecting saturation.

The reversing rheostat is mounted in the rear of the propulsion switchboard and is operated through shafts and bevel gears from a handwheel on the front of the board or from a control pedestal located directly above in the wheel house. Normal operation will be from this pedestal so that the pilot will have complete control of his propelling motor. The lever on the pedestal moves forward through an angle of 45 degrees from the vertical position to the full speed ahead point, and back a similar distance from the vertical position to the full speed astern point, with speed points each way. The small panel on the top of the pedestal carries a generator and motor voltmeter, line ammeter, an indicator showing the revolutions per minute of the propelling motor, a red and a green indicating lamp to indicate when the main line contactor is open and closed respectively and a hooded illuminating lamp. The pedestal is located conveniently close to the steering wheel so that the operator has complete control of his ship at his finger tips at all times and can tell, by a glance at the instruments on the pedestal, the conditions under which his machinery is working.

The control is arranged so that in case of an extreme overload which would open the main line contactor, the operator has only to move his control lever back slightly and the contactor will automatically reclose as quickly as the voltage conditions have become normal, the contactor being under control of suitable relays.

Switches are provided so that either main generator may be cut out of circuit and still allow for operation from the other set. This gives an economical cruising speed and makes a very flexible plant, for, in case of trouble with one set, the ship can be operated at about 75 per cent speed from the other while repairs are being made on the disabled one. Thus the chances for complete shut down are very remote. Main switches, with interlocked field switches are also provided so that either main generator may be connected to the auxiliary power bus to supply ship's auxiliaries and appliances at such times as the excess capacity of the exciters, over that required for excitation, is not sufficient. The interlocked field switches automatically transfer the generator field connection from the reversing rheostat to standard regulating rheostats, when the main switch is closed to connect the generator to the auxiliary power bus. The generators will operate as separately excited shunt machines in this case, taking power from their respective exciters. Only one of the generators may be connected to the bus at one time.

The auxiliary switchboard is located on the port side of the control room. It carries control for a 5-kilowatt, 125-volt auxiliary generator, battery charging control, bus transfer switches and all feeder switches for the various auxiliary and lighting circuits. It will be be seen from the diagram that maximum flexibility has been provided. The bus layout and interconnecting switches are arranged so that lights and most of the auxiliaries may be supplied with power from any one of four sources; namely, either main generator, either exciter through the excitation bus, the auxiliary generator or the storage battery. A switch is provided so that in an emergency, power may be taken for excitation of the propelling machinery from the auxiliary generator.

By substituting this type of propulsion machinery for the old reciprocating drive, it was found that considerable space could be gained for quarters and much needed passage ways, so that the general layout and arrangement of the yacht was greatly improved. When we consider the additional advantages obtained, such as greatly increased cruising radius due to the much more economical diesel engine, reduction in the engine room force due to elimination of boilers, etc., cleanliness, decreased vibration, power supply so that convenient electrical appliances can be used throughout the ship, refinement of control, and increased safety because the propulsion control is placed in the hands of the pilot and because there is so little chance of a complete shut down of the plant, we see why this system is finding so much favor in this field, as well as on many other types of vessels. Similar installations have been made on the schooner yachts Elfay, Guinevere, and Alcoyne, as well as on the Volero II, which is a power yacht. All of these vessels have given excellent service.

DIEHL GENERATING SETS

On page 223 of the April issue of Pacific Marine Review was shown a view of the engine room of the motorship Seekonk, and in the caption underneath this view mention was made of Cramp-Westinghouse diesel-electric sets.

This statement was an error on the part of Pacific Marine Review, and we are glad to make correction by stating that the electric generating sets on the Seekonk as well as on the Californian, the Missourian and the William Penn are **Cramp-Diehl diesel-electric generating sets.**

We are also informed that in all of these ships the motors driving the engine room auxiliaries are Diehl motors.

TRAWLING FOR FISH WITH THE AID OF RADIO

By G. HAROLD PORTER
General Marine Superintendent, Radio Corporation of America

NOTWITHSTANDING the fact that fish is a basic and valuable food, the trawling industry has always been an uncertain one. Many trawling companies have gone into bankruptcy in recent years, for the experience of the lone fisherman who shoulders his rod and goes afishing was repeated on a vastly larger scale in the trawling industry. A constant supply of fish must be kept coming into the market, which makes it imperative for fishing boats to adhere to a form of schedule. Thus it has always been necessary to instruct the captain of a trawler exactly how many days he must remain out. At the end of this period—about nine or ten days—he must bring his ship into port whether he has caught 25,000 pounds of fish or 125,000 pounds. The financial risk is obvious when it is realized that it costs approximately $200 a day to operate one of the larger trawlers and that the proceeds of a ten-day trip often do not amount to two thousand dollars.

This was the position in November, 1922, of the Portland (Maine) Trawling Company, a subsidiary of the Atlantic Coast Fisheries Company of New York City, which operates a fleet of four steamers in deep sea fishing. In December, 1922, the company decided to put marine radio on all four of their vessels. The sets were rented from the Radio Corporation of America. Operators were supplied by the Radio Corporation, and all repairs on sets were made by the same company.

The change that has since taken place in the trawling industry perhaps is best described in the words of an official of the Portland Trawling Company.

"You will understand our situation before we installed radio from just one incident. It was a Monday morning in November, 1922. I went down to the dock expecting to find the Gea Gull. Instead there was the Fisher, not due until Wednesday. She was loaded with 100,000 pounds of fish. She had sighted the Sea Gull on the banks, and had learned that the Sea Gull had had poor luck, and had only caught 20,000 pounds of fish. If she came into port on schedule time, it would have meant a great financial loss to the company. As it was, the Sea Gull appeared Wednesday morning with a catch of 70,000 pounds. In the extra two days she had been very fortunate. That set us thinking. Of course, we had to have our loads follow a schedule. We had to have a boat come in regularly every two or three days. It is seldom that two boats meet on the 20,000 square miles of fishing area on the banks. So we could not depend on such physical contact in order to bring home the boat with the largest catch. There was no way by which we could communicate with them, lacking in radio equipment as they were.

The trawler Blue Point coming into New York harbor after a hard winter cruise.

"We decided to add 5 per cent to our expenses and put on radio, and we have had reason to be satisfied with our action. Now, when we send a ship out we do not include a specified return date in the captain's sailing orders. We are kept constantly informed of the amount of the catch, and by radio we can order the ship to return to port in six days, or we can keep it out as long as fourteen days.

"Because we always know just how many pounds of fish of each kind there are on board, selling is made much easier.

"In order to achieve the maximum amount of efficiency, it is essential to cut down each vessel's unproductive time to a minimum. The less time a trawler spends in port, the greater the profit that she can make. One of the biggest services that radio renders is to cut down unproductive time as much as possible. Each trawler makes known her port accommodation needs long before she arrives. In one case a message came to us via radio saying that the Petrel needed new piston rings. Long before the vessel docked, the twenty-four hour job of getting those piston rings ready for installation was completed.

"The Fisher had been out ten days. She had a full catch and was returning to port. The Sea Gull, out only three days, had her fishing gear so badly damaged that it was useless for her to remain on the banks. A radio message from the Sea Gull brought the Fisher hurrying to transfer fishing gear. This message was received at the same time by the Portland Trawling Company. When the Fisher arrived in New York, the company had new gear ready for her. This effected a saving of three days' time—$600 for the Sea Gull.

"Fogs are very dense on the banks. This is especially true in the winter months of the year. Often it is impossible to take the bearings of a vessel for days at a time. A radiogram to shore will bring back a speedy answer that will enable the ship to learn at once just where she is. The direction from the ship to the shore station can be told with unfailing accuracy. When two shore stations of known location flash back the direction, the position of the ship can be worked out by triangulation, and much time heretofore lost in cautiously feeling their way or in laying to is saved. The safety of all vessels is always enhanced by the regular receipt of weather reports."

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

AN INTERESTING SHIPYARD TOOL

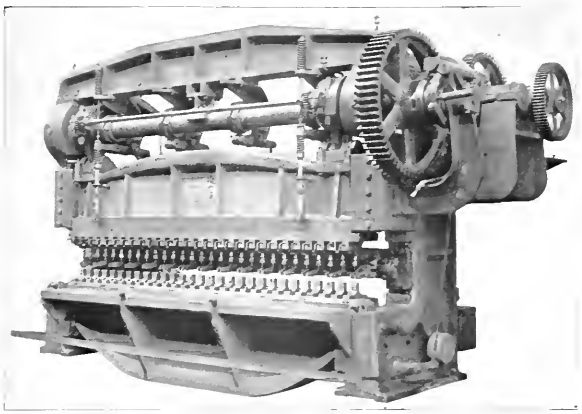
The Cleveland Punch & Shear Works Co. of Cleveland, Ohio, Develop a Novel Combination Multiple Punch, Gate Shear, and Gap Forming Press, which is Proving Itself a very Useful and Efficient Adjunct in Shipbuilding Practice

THE Cleveland Punch & Shear Works Company of Cleveland, Ohio, has recently developed a combination multiple punch, gate shear, and gap forming press which has a number of novel and very efficient characteristics. The machine complete weighs 40 tons, measures 12 feet 2 inches between housings, and has a 15-inch gap.

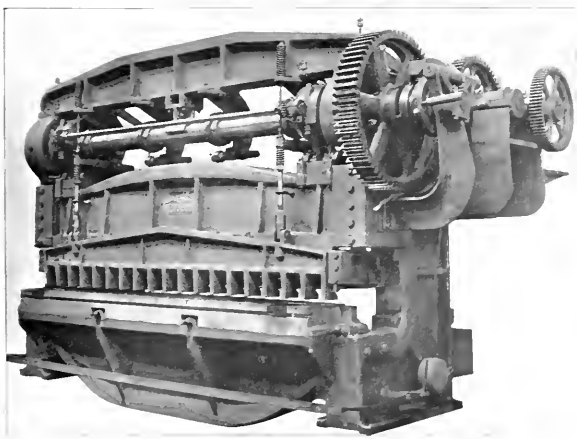
As arranged for a multiple punch it is provided with an automatic stripper, which is operated by cams and levers and has adjustable trunnions, so that the flat finished face of the stripper fingers will always strike the material squarely on any thickness of material between minimum and maximum limits of the machine. This adjustable feature tends to greatly reduce the breaking of punches, which is so incident to strippers which strike the material in an angular or "cocked" position.

The attachment of punch and punch block is made with one bolt. This feature is patented and is a very great improvement over the ordinary tee-shaped attachments having bolt front and rear. In these latter it is almost impossible to get at the rear bolt without first removing the strippers, which operation requires a man both at front and rear and the probable use of a crane. On this new design of single blade attachment one man can do the setting up with greater speed and less trouble.

The adjustable cup strippers are each composed of a steel casting and are held by one bolt, which is very accessible so that these also may be readily adjusted or removed from the front of the machine.



Cleveland combination multiple punch and shear arranged as multiple punch



Cleveland combination multiple punch and shear arranged as gap

ANNOUNCEMENT

The July issue of Pacific Marine Review will be an equipment and supply special.

Each department in that number will be filled with material prepared by experts and approaching the subject matter from the angle of marine equipment.

Manufacturers of such equipment are invited to submit descriptive articles for publication. Such articles should be in the hands of the Editor not later than June 15.

A MERCURY VAPOR TURBINE

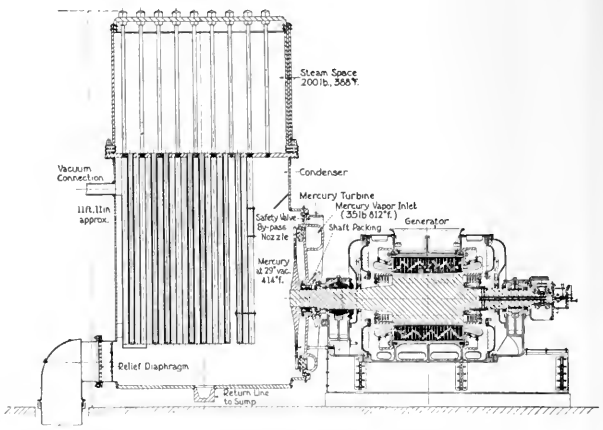
By W. L. R. EMMET*

IN this process, mercury is vaporized in a boiler at high temperatures. The mercury vapor is then carried through a turbine, doing useful work, and is exhausted into a surface condenser, where its latent heat is used to make steam at pressures desirable for use. The condensed mercury is carried back to the boiler to complete the cycle of operation.

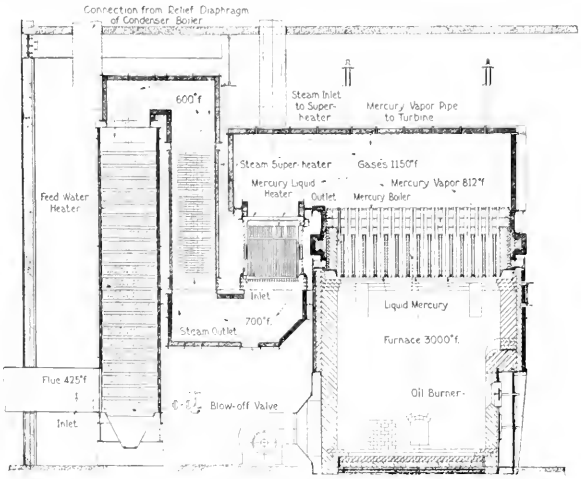
The characteristics of mercury permit of high temperatures without excessive pressures and of delivering the heat of condensation at ordinary degrees of vacuum and at temperatures suited to the production of steam at ordinary commercial pressure ranges.

This process was first explained by the author to the American Institute of Electrical Engineers in 1913, and it was then acknowledged that much original work had been done on the process by Charles N. Bradley, who had taken out a patent involving the general principle but had not indicated the use of mercury.

After a campaign of experimentation an equipment designed to deliver 1500 kilowatts from the mercury turbine was built for installation in the power station of the General Electric Company at Schenectady. This equipment was put in operation in 1917. Many practical difficulties were encountered and a long time elapsed before it could be run under full load. The results showed that the economies hoped for could be realized, and the building, changing, and handling of this apparatus afforded practical experience for the production of superior equipment.



Section through mercury vapor turbo-generator and condenser.



Section through mercury boiler, liquid mercury heater, feed water heater, and superheater.

Boiling conditions of mercury are very different from those of water. Mercury does not wet the surface of metal containers and there is a wide difference of pressures at different depths. Many experiments have been carried on to get at the correct theory of mercury vapor production, of the circulation of liquid mercury, and of temperature determinations. A number of types of boilers of workable size have been built and tested. As a result of this experimental work there has been installed at the plant of the Hartford Electric Light Company, Hartford, Connecticut, an equipment designed to operate with 35 pounds gauge pressure on mercury boiler, to deliver 1800 kilowatts from the mercury turbine, and to make steam from the mercury condenser at 200 pounds pressure with about 100 degrees of superheat.

The diagrammatic illustrations herewith show the character of the apparatus employed. The furnace gases from the oil burners under the mercury boiler pass first through the mercury boiler then through a mercury liquid heater, a

*Abstract of a paper contributed to the Power Division at the spring meeting of the American Society of Mechanical Engineers, Cleveland, O., May 27, 1924.

steam superheater, and a feed water heater. It is thought from the experiments that it will be more economical hereafter to substitute an air heater for the feed water heater, putting this residuum of heat into the mercury instead of into the steam, and accomplishing the feed heating by bleeding the steam turbine as in the best central station practice.

From the boiler the mercury vapor passes through a governing and emergency valve to the mercury turbine, which is a single stage overhung wheel on the end of the generator shaft and which operates in the condenser space. Safety valves are arranged to by-pass the vapor into the condenser whenever the governor causes the turbine valve to close, so that the mercury vapor continues to condense and make steam whether it is passing through the turbine or not.

The shaft packing between the generator and turbine wheel is sealed by mercury vapor above atmospheric pressure and the outward leakage from this packing is sucked into a cooler where it is all condensed and returned to a mercury boiler. Discharge from the turbine wheel is delivered directly against the condensing surface, which consists of dead-ended tubes hung vertically from a cylindrical water drum, to which they are attached by rolling and arc welding. The condenser shell and all pipes and containers carrying mercury are welded. The liquified mercury from the condenser runs through a sump to the mercury heater and boiler by gravity.

This Hartford equipment has been run for several months. No serious troubles have developed. It has delivered power to the circuits for about 800 hours. The average load has been about 1200 kilowatts. Fuel oil, steam flow and feed have all been measured carefully at Hartford and if the steam produced were used effectively the fuel rate, at a 1200 kilowatt load with single stage turbine of about 60 per cent efficiency and with 22 pounds mercury pressure, is estimated at 12,000 b. t. u. per kilowatt hour. This is to be compared with practical fuel rates for central stations as now operated from 18,000 to 20,000 b. t. u. per kilowatt hour. In other words, the mercury turbine shows a gain in economy of fuel ranging from 50 to 65 per cent.

De Laval Oil Purifier on High-Powered Diesel Tug

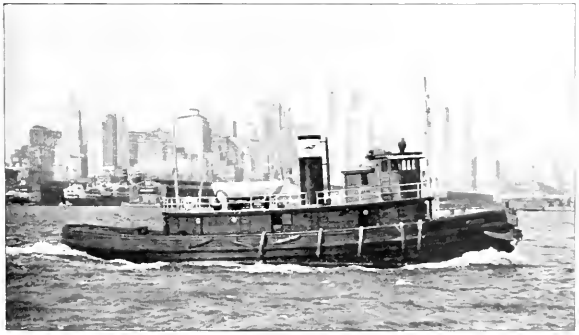
THE tugboat Jumbo, built by the New London Ship & Engine Company and operated by the Transmarine Corporation of Port Newark, is said to be the highest powered diesel-driven vessel of its kind in America, and is unique in several other ways among harbor craft. Her hull was partially completed by the Shipping Board and sold to the John W. Sullivan Company of New York City and later to the New London Ship & Engine Company. She was completed by this company and powered with a 600 horsepower Nelseco diesel engine.

One of the outstanding features of the Jumbo is her radius of action of about 350 hours at full power. This is made possible by the fact that she has oil engine power and has a fuel oil bunkering capacity of 14,000 gallons. Operated continuously 24 hours a day, her crew will consist of nine men.

As a further insurance of continuity, reliability, and economy of operation, a De Laval oil purifier has been installed to provide the Jumbo's engines with clean lubricating oil at all times. This, of course, will minimize bearing wear and eliminate the trouble that ordinarily follows the use of dirty oil. In addition, the purifier will make it entirely safe to keep the same oil in service indefinitely, thereby effecting a considerable reduction in the cost of lubrication.

Water-Level Control for Floating Docks

IN order to permit of scientifically docking ships in floating drydocks and to eliminate the strains incident to docking by the "rule of thumb" method, Chas. Cory & Son, Inc. manufacture a direct and remote reading electrimechanical water level indicating and drydock control system.



Transmarine corporation tug Jumbo, powered with a 600-horsepower Nelseco diesel and equipped with De Laval centrifugal oil purifier.

The function of this system is to determine the amount of water in each compartment of a pontoon, from which can also be determined the weight of the ship being docked. The angular list of each pontoon is transmitted in order that the dock may be set properly to receive the ship and care for the distribution of weights.

Means are also provided for determining the amount of opening of valves, and when the remote control of the pumping motors is located adjacent to the Cory control switchboard (which is installed at the docking master's position), the system in general will permit of practically every operation in connection with the docking of a ship being performed from the docking master's position.

The Cory water level indicating and drydock control system was invented by J. S. Jones, vice-president and general manager of the Cory corporation, who, in conjunction with the United States Government and ship dry-docking companies, made a thorough study of the re-

quirements for docking vessels. The system which Mr. Jones invented is now in use in a number of drydocks, and has proved to be highly satisfactory and efficient.

In order to illustrate more clearly the operation of the system a brief description of the individual units follows:

The local indicators and remote transmitters, which are located on the drydock, consist of a pedestal on which is mounted a watertight case containing all necessary gearing, an a dial graduated in feet and inches, with pointer, is provided for indicating at all times the amount of water present in a compartment. An alternating current electric transmitter for transmitting the indications to the indicator in the docking master's position is also contained in the same watertight case. Usually, there are a number of indicator transmitters for each pontoon to indicate the water level in both the port and starboard compartments, the electric transmitter of the instrument being connected to the water level indicator.

The water level indicators are mounted on the switchboard at the docking master's position and are provided with a manually operated pointer so that the predetermined amount of water desired in a compartment can be set, and when the electric pointer, operated by means of the transmitter, matches the manually set pointer, it indicates that the compartment contains the amount of water desired.

A list transmitter is installed on the dock, with an indicator on the switchboard in docking master's station, permitting the dock to be listed at the proper angle; and at the same time permits of a check being had of the difference in list of dock and the ship so that the ship may rest evenly on the keel blocks and automatically eliminate strains.

The switchboard provided at the docking master's position is usually of the benchboard type, made of rust-proof iron, or any desirable switchboard material. This board contains all the indicating units, control switches for pumps, etc., so that the complete operation of the dock may be effected at one point. All instruments are flush type, mounted on the face of the switchboard.

The Cory electro-mechanical water level indicating and drydock control system requires a surprisingly small amount of current for its operation, and the necessary current can always be obtained from existing lighting or power circuits by means of a small transformer.

New Portable Arc Welder

A NEW portable arc welder, embodying distinctive features of economy, simplicity, adaptability, and dependability, is now on the market. This unit is said by the manufacturer to be designed to insure smooth and rapid deposition of metal with thorough penetration. It will deliver continuous power and permit rapid production, both with high current and large electrodes, as well as with low current and small electrodes.

This welder is a two-unit set, consisting of a motor and a generator. The generator is self-excited, thereby eliminating the necessity of a separate exciter. All regulation of current is accomplished by turning a handwheel on the generator. A self-adjusting, stabilizing reactor is provided, which automatically steadies the arc under all welding conditions.

The new welder is made by the General Electric Company. It can be used with any of the commercial sizes of metallic electrodes from 1 16-inch to 1 4-inch in diameter. Generator voltage can be adjusted to suit the character of the work. High voltage for complete penetration on heavy work and low voltage to prevent burning through on light work are thus secured at will. Any value of current between 75 and 300 amperes can be obtained in a large number of steps between these limits.

Among the operating advantages of this outfit are: an arc easy to start and maintain, roller bearing wheels, holes in base for crane hooks, and adaptability to long or short leads for working close by or at a distance from the set.

Among the mechanical advantages are included motor and generator insulation, designed to withstand severe operating conditions both with regard to duty cycle of the load imposed and general atmospheric conditions under which ordinary insulation fails. Bearings are waste-packed and oil cannot be spilled if the set is tipped when being moved.

This WD-12 generator is a two-pole, self-excited, constant energy, single-operator machine with a dual magnetic circuit designed to operate at 60 volts open circuit and 20 to 25 volts under load. It is rated 200 amperes for continuous service, 250 amperes for one hour and 300 amperes for short periods. The motor is a standard General Electric 10 horsepower unit. The complete set has three bearings, the two units being close-coupled by a solid flange coupling. All parts, including generator, motor, generator control panel, motor starter, and stabilizing reactor are mounted on a welded structural steel base of rigid construction and light weight.

The assembled unit is about 63 inches long, 29 inches wide and 47 inches high, weighing about 1600 pounds.

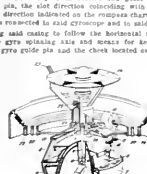
Halibut schooner Scandia, equipped with 2-cylinder, 160 brake horsepower Bolinder engines.

Pacific Marine Review

MARINE PATENTS OF THE MONTH

1,492,233. GYROSCOPIC COMPASS. Oscar Martinsson, Kiel, Germany. Filed Aug. 31, 1921. Serial No. 497,417. 3 Claims. (Cl. 33—204.) (Granted under the provisions of the act of Mar 3, 1921, 41 Stat. L., 1313.)

1. In a gyro compass having a gyroscope and a rotatable casing for vertically suspending the gyroscope rotatably in the casing, to permit its spinning axis to swing into the meridian, a compass chart fixed on said casing and guiding pins operatively connected to the upper and lower portions of the gyroscope to vertically center it in the vertical axis of the compass chart, a pair of parallel checks attached to said casing and forming a guide slot adapted to receive and guide said lower guide pin, the slot direction coinciding with the north south direction indicated on the compass chart, operating means connected to said gyroscope and to said casing for causing said casing to follow the horizontal movements of the gyro spinning axis and means for keeping said lower gyro guide pin and the check located on the west



side of the chart axis in contact with each other at suitable pressure to have the gyro spinning axis has swung into the meridian, for damping the oscillations of the gyro spinning axis about the meridian.

1,492,234. ARRANGEMENT ON GYROCOMPASSES FOR PREVENTING ERRORS DUE TO ROLLING OF THE VESSEL. Oscar Martinsson, Kiel, Germany. Filed Aug. 31, 1921. Serial No. 497,419. 7 Claims. (Cl. 33—204.) (Granted under the provisions of the act of Mar. 3, 1921, 41 Stat. L., 1313.)

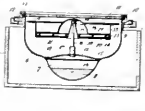
1. An arrangement for gyro compasses for preventing errors due to rolling of the vessel, the combination with a meridian gyro and suitable supporting means to permit his spinning axis to freely swing into the gyro elevation, of a second gyro having a vertical spinning axis and being attached to said supporting means, in order resistance to any force tending to turn said supporting means in a plane at right angles to the meridian compass axis, thereby preventing substantially in the direction of the plane of elevation of the meridian gyro spinning axis and thereby tending to suppress said turning movement.

1,491,592. COMPASS. Ernst B Ehrsam, Brooklyn N Y., assignor to Ernest W Marshall, Yonkers, N Y Filed Sept. 24, 1919. Serial No. 326,007. 3 Claims. (Cl. 33—222.)

1. In a compass, the combination with the bowl there of, of a stepped ring surrounding the rim of the bowl, a flange projecting laterally from the bowl rim and seated on the step, a transparent cover seated on the flange, and means providing a seal between the flange and cover.

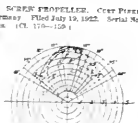
1,493,215. ARRANGEMENT ON GYROCOMPASSES FOR PREVENTING ERRORS DUE TO ROLLING OF THE VESSEL. Oscar Martinsson, Kiel, Prussia, Germany. Filed Aug. 31, 1921. Serial No. 497,420. 5 Claims. (Cl. 33—204.) (Granted under the provisions of the act of Mar. 3, 1921, 41 Stat. L., 1313.)

1. In an arrangement in a gyro compass for preventing errors due to rolling motions of the ship, the combination of a meridian gyro, a float for supporting said gyro, a float chamber containing said float and means for centering said float relatively to said chamber and centering means having means for permitting said float to oscillate relatively to the chamber in the direction of the line of elevation of the meridian gyro axis, and for preventing such oscillation in a plane at right angles thereto, and a vertical gyro mounted at a suitable point of the entire indicating movement and adapted to offer



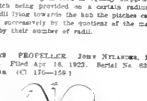
resistance to any force tending to oscillate the indicating movement in a direction at right angles to the meridian gyro spinning axis.

1,491,457. SCREW PROPELLER. Curt Pierret, Dresden, Germany. Filed July 19, 1922. Serial No. 576,100. 6 Claims. (Cl. 170—159.)



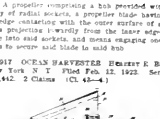
1. Screw propeller comprising a hub and blades with a pitch decreasing from the hub to the periphery, the largest radius being divided in equally stepped radii, a main pitch being provided on a certain radius as the other radii lying towards the hub the pitches each being enlarged successively by the quotient of the main pitch divided by their number of radii.

1,491,729. PROPELLER. Jonn Nylander, Muskegon, Mich. Filed Apr. 16, 1923. Serial No. 632,514. 6 Claims. (Cl. 170—159.)



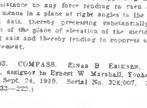
1. A propeller comprising a hub provided with a plurality of radial sockets, a propeller blade having its inner edge contiguous with the outer surface of said hub, studs projecting inwardly from the inner edge of said blade into said sockets, and means engaging one of said studs to secure said blade to said hub.

1,491,917. OCEAN HARVESTER. Herbert E Blackie, New York N Y. Filed Feb. 12, 1923. Serial No. 618,462. 2 Claims. (Cl. 43—4.)



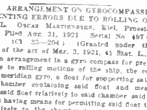
1. In combination with a ship, an angular net projecting from the bow of the ship, said net being secured alongside the forward gunwales of the ship, the entering edge of said net being below the keel of the ship, a set of conveyors mounted outside the forward gunwale of the ship extending angularly upward from the net to the deck of the ship, said conveyors being adapted to remove the fish from the net and carry the same to the deck, a food or searchlight mounted on the ship and adapted to illuminate the body of water in front of the net, and means for retaining the fish in place on the angular conveyers.

1,491,509. SUBMARINE MINE. Hartley B Pratt, Barrow-in-Furness, England, assignor to Vickers Limited, Westminster, England. Filed May 2, 1923. Serial No. 636,255. 9 Claims. (Cl. 102—3.)



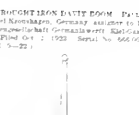
1. A submarine mine comprising a flotation chamber a sinker, a mooring cable connecting said sinker to said flotation chamber, a drum within said sinker on which said mooring cable is wound, a plummet, a line connecting said plummet to said sinker the weight of said plummet being adapted to unwind said plummet line a device which is displaced during the unwinding of said plummet line, adjusting means for altering the initial starting position of said displacement device, and locking means for the mooring cable drum which are released by said displaceable device when a predetermined length of plummet line is unwound so as to allow said mooring cable to unwind and the flotation chamber to separate from the sinker.

1,491,555. MORTAR FOR THROWING LINE-CARRYING PROJECTILES. Frank O Hall, Philadelphia, Pa. Filed Oct. 21, 1920. Serial No. 419,221. 1 Claim (Cl. 89—37.)



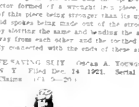
In a mortar of the class described, in combination a portable base adapted to be secured to a deck or other machinery object and having a pin projecting upwardly therefrom and also having a plurality of apertures therein disposed along an arc having said pin as a center, a carriage having an aperture at its rear end to receive said pin and having an aperture at its front end adapted to be brought into register with any one of said apertures in the base, removable means for inserting into two such aligned apertures to prevent relative movement of the carriage and base and a barrel mounted on said carriage

1,490,670. REINFORCED CONCRETE DOCK. Paul Adolf Miller, Karl Nienhagen, Germany, assignor to Fried. Krupp Aktiengesellschaft Germaniawerft Kiel-Gaarden, Germany. Filed Oct. 7, 1922. Serial No. 593,606. 4 Claims. (Cl. 5—22.)



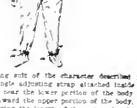
A wrought iron dock built with a separately made vertical sector, having the lib arm and the spokes for the toothed sector formed of a wrought iron plate, the lower portion of this plate being stronger than its upper portion, the said spokes being made out of the stronger lower portion by slotting the same and bending the arms thus formed away from each other and the toothed sector being rigidly connected with the ends of these arms.

1,490,660. LIFE-SAVING SUIT. Oscar A. Townsend, New York, N Y. Filed Dec. 14, 1921. Serial No. 520,352. 4 Claims. (Cl. 9—20.)



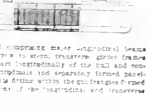
1. A life-saving suit of the character described provided with a single adjusting strap attached inside the suit one end to near the lower portion of the body and the other end toward the upper portion of the body, and means for adjusting the length of the same whereby the length of said suit may be regulated by causing an over lapping of the suit, substantially as set forth.

1,490,567. REINFORCED CONCRETE AND STEEL SHIP CONSTRUCTION AND METHOD OF MAKING THE SAME. Eli H Bowman, Chicago, Ill. Filed Feb. 13, 1919. Serial No. 276,871. 15 Claims. (Cl. 114—42.)



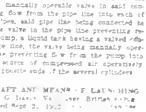
1 A ship hull comprising a set of longitudinal beams extending from prow to stern, transverse girder frames widely spaced apart longitudinally of the hull and connecting said longitudinals and separately formed parallel-like webs and a frame with the girder frames formed by the intersection of the longitudinal and transverse frame members.

1,490,449. DUMPING MECHANISM FOR DUMP SCOWS. William V Mackie, Green Bay, Wis. Filed July 14, 1923. Serial No. 651,253. 3 Claims. (Cl. 114—36.)



1. A scow divided to form a plurality of hoppers, a pair of vertically movable dumping gates associated with the lower ends of each hopper and means for operating said gates comprising a plurality of cylinders associated with each hopper, a piston in each cylinder, operative connections from the piston to the corresponding pair of gates, a hand pump, a series of pipes each pipe being common to the cylinders associated with a hopper, a pipe line operatively connected at intervals to the series of pipes, a manually operable valve in said connection connecting the pipe line into each end of the first named pipes, said pipe line being connected to the pump, a check valve in the pipe line preventing reverse flow to the pump, a by-pass having a valved connection to the pipe line, the valve being manually operable a relief valve preventing flow from the pump into the tank, and a source of compressed air operatively connected to the opposite ends of the several pistons.

1,491,586. LOG RAFT AND MEANS FOR LAUNCHING SAME. Norbert G. Isaacs, New Orleans, La. Filed Sept. 2, 1919. Serial No. 321,997. 10 Claims. (Cl. 9—8.)



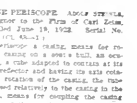
1. In a log raft, a raft floor logs arranged [illegible] upon the floor means for connecting the [illegible] the floor and logs, [illegible] the floor [illegible]

1,491,544. SALVAGE DEVICE FOR SUNKEN SHIPS. John Y Cowles, Chicago, Ill., assignor to Sophia E Cowles, Chicago, Ill. Filed Feb. 1, 1923. Serial No. 616,420. Renewed Jan. 14, 1924. 3 Claims. (Cl. 114—51.)

3. A device of the character described comprising a pivoted pivoting member, a universal joint in the shank of said member a sleeve slidable on said shank adapted in one position to hold said joint rigid and in another position to allow of free movement of said joint.

1,492,583. SUBMARINE PERISCOPE. Adolf Spindler, Jena, Germany, assignor to the Firm of Carl Zeiss, Jena, Germany. Filed June 19, 1922. Serial No. 568,581. 2 Claims. (Cl. 88—1.)

1. In a submarine periscope a casing, means for rotatably supporting said casing on a scow's hull, an ocular fitted to this casing, a tube adapted to contain at its upper end an optical objective and having its axis coinciding with the axis of rotation of the casing, the tube being eccentrically disposed relatively to the casing in the direction of these axes, means for coupling the casing and the tube for joint rotation, and a gearing adapted to displace the said tube in the said direction and con-



taining at least one worm wheel rotatably disposed on the casing and a worm engaging in this worm wheel, the axis of which coincides with the axis of the casing.

1,490,428. BREAKWATER. John P Crawford, Eagle, Ill. Filed Jan. 29, 1921. Serial No. 441,025. 2 Claims. (Cl. 61—4.)

1. A break water comprising a series of monolithic concrete cribs composed of side and end walls, the end walls having tenon-and-groove portions and recesses fitting in said cribs and a monolithic concrete cap extending

over a portion of said cribs and partially into the interior thereof to maintain them interlocked.

1,492,074. SIGNAL BUOY. George Irvine Cleppy, Stewart, Saskatchewan, Canada. Filed July 6, 1922. Serial No. 573,260. 1 Claim. (Cl. 9—9.)

A buoy comprising a body portion, weighted at its lower end and open exteriorly from said body portion thereto and adapted to [illegible] through the same and open exteriorly [illegible] of the body portion and above the [illegible]

1,491,754. AIR-CIRCULATING SYSTEM FOR CARGO VESSELS. John Howe Bowditch, N Y. Filed July 19, 1920. Serial No. 397,143. 3 Claims. (Cl. 114—31.)

1. In a cargo vessel a plurality of decks providing a plurality of cargo compartments alternate decks having openings formed therein establishing communication between the cargo compartments a channel and diverging ducts communicating provided in the cargo compartments decks located in said compartments for circulating air, means mounted in said compartments for

controlling the temperature of the air as it circulates means for discharging air from the compartments and means for controlling said discharging means.

REMINISCENCES OF THE DAYS OF STEAM

OBSOLETE INSPECTION RULES

By A. VICTIM

HAVING had much experience in the operation of steamships under many different flags, the writer feels that he is competent to criticise the methods regulating American steamers. Much has been written about freight differentials, rebates, subsidies, and so forth, but little has been mentioned regarding the inspection laws.

While these latter are admirable in many ways, they are also in many ways obsolete and costly. Commencing with the regulations governing boilers and engines, I note that before any person can obtain an original license as engineer he must be able to figure the weight of ball, lever, etc. (diameter of valve and pressure being given). As such a method of relieving excess pressure on boilers is no longer used, I fail to see the necessity for such a requirement. To calculate the turns, pitch and size of spring steel would be more modern.

Then, the yearly application of hydrostatic pressure seems to me a very unnecessary thing to do. In the first place it demoralizes all the peacefulness of the boiler plant and upsets things for weeks after it is over. Joints are started leaking, rivets started, and a general mess results from the practice, which, it is respectfully submitted, is a poor substitute for a careful hammer test and personal inspection. A hydrostatic test is admirable occasionally, especially after extensive repairs or a new job, but a plant that has only run a year or so obviously does not need it. Greater maritime nations than ours do not subject boilers to such strains annually. It is also an expensive matter, as in nearly every instance it is done in a hurry, and this means extra money for overtime. Also the cost of rigging up force pumps and blanking off live boilers from dead ones is considerable.

Again, the preparation of a boiler for inspection has often to be made to suit the idea of an individual whose notions may not be like some one else's. This makes for difficulty and breeds confusion. Removal of furnace fronts is made compulsory by one inspector, while another will be contented with only a door out, through which he will enter to examine the combustion chambers, furnaces, and tubes.

Setting of safety valves under hydrostatic pressure hardly ever makes for exactness, and as a rule musses things up badly. If done under steam it is believed better results would obtain at less trouble and cost.

Another accessory to boilers made imperative in American steamers is the fusible plug. The writer knows of no other country where this is done. Neither does he know that any more crowns are burned out in boilers without plugs than with them. As a matter of hard fact, these plugs are a nuisance most of the time, for they often blow when there is plenty of water over them and no dirt gathered, causing trouble and delay, and in some cases danger to the safety of the ship and cargo owing to loss of steaming power through failure of the boiler.

It is fortunate, however, that the personnel of the inspection force are men of good, practical knowledge. It is known that as a rule they are very liberal in their interpretation of the laws and avoid needless harassing of steamship owners. But even at that, there is still much to be desired to relieve American owners from financial loss due to inspections which other nations' ships do not incur.

A Copper Kettle and a Grass Hopper

By SLICE BAR

A QUEER old craft was the Politoffski, which for many years was operated on Puget Sound as a lumber mill towboat. The Polly, as she was known to all the old-timers, was originally a Russian gunboat, built in Sitka, of yellow cedar. Most of her fastenings were copper. Her original boiler was made of copper plates. Her engine was a sort of steeple type, or, rather, a modified side-lever grass-hopper, with a cylinder placed in the hull much as a beam engine one and with the piston rod working up through the top in the same way. This was connected by a crosshead to two connecting rods, one at each side. These in turn were connected to side levers, the fixed ends of which were held by pillow blocks. About half way of their lengths these side levers were connected together across, with a heavy pin, from which the connecting rod to the crank was fastened. This type of engine was quite the vogue in British towboats some fifty years ago, and it is believed that the engine of the Polly was built in Scotland, though there is no certainty of this. She had a jet condenser.

Of her copper boiler, though, there is no doubt and, as obviously its pressure carrying limit was low, it was changed after the vessel was bought from the Russian government. Just what year this deal was made is not known, but it was in the 70's that the late Captain G. O. Mieggs of the Port Madison Mill Company bought her. He had her reboilered in San Francisco, the contractor taking the old copper boiler in full payment for the new iron boiler and doing all the installation as well. Probably some of the old hands may remember this incident.

A Mr. Martin Pape was chief engineer of the Polly, he having been aboard of her for seventeen years. The captain was an Austrian named Frank Smitz, who was quite a character in the lumber days of old. The steamer did good service for many years towing log rafts to the Port Madison mill and handling some of the sailing vessels in and out as well. She could pull well, for, being low in the water, her paddles took a good grip when the sea was smooth. In a choppy sea she was not of much service, but still managed to get by.

During the great Klondike rush, when any and everything that would float was pressed into service from Seattle and other Pacific ports, the old Polly was dismantled and converted into a barge, being towed to the northern "land of gold."

Common Sense Needed

By T. SQUARE

STORIES innumerable have been told of errors in design of ships and engines. Some of these are comical, to say the least. Others are pathetic. Most of them are costly. If I remember rightly, several years ago a naval vessel was designed in Washington. She was to be the last word in naval architecture; her batteries were to be powerful; her speed phenomenal; she was to embody all the latest maritime science; but as she neared completion of plan it was noticed that no provision had been made for fuel. She was absolutely without bunker space. Of course, this was remedied, but it was a costly error at that.

I know of another slight error which happened in San Francisco. A condenser had been designed for a new coasting steamer. It was of ample cooling surface and well built mechanically. But on trial trip it was found that it did not pull the vacuum as it should. The circulating discharge water was cool, but the condensate was very hot. All sorts of theories were advanced as the why, but none of them seemed to hit the spot.

Setting down quietly and thinking it out, the solution was obvious. The condenser was a "two-pass" one. The circulating water was forced into the port end by the centrifugal and was presumed to pass through the upper half of the tubes and then return to the discharge nozzle at the bottom of the port head. It did this all right, but did not go through all the upper or lower tubes. The designer had provided stiffener wegs on the doors and had put these in vertically. They also came rather too close to the tube ends. The result was that the circulating water followed the line of least resistance and nearly all of it flowed through a few of the side rows of tubes with the result as described.

The superintendent of the shop was told of this theory, and being willing to try almost anything to get the vacuum, had the doors taken off. He saw that the supposition was correct. The webs were nicked with a chisel and broken off, doors replaced, and things started again, with a resultant good vacuum and temperatures as they should be.

Speaking of condensers and mistakes, I will mention an incident that came under the writer's notice in China some years ago. A certain Chinese owned and operated shop built some small steamers for the local trade. They were, as a whole, good jobs, for the Chinese are painstaking and good mechanics. The particular mistake in question was a twin-screw job, built for the coast trade. This vessel was of light draft to enter small harbors. In order to conserve space, the condenser (there was but one for both engines) was placed between the thrust block 'thwartship. The job was light draft, as above mentioned. Her shafts were set comparatively high and she had no double bottom. Her engines were well separated, and the position chosen was admirable, except for one unfortunate oversight. The job was built and ran well, but whenever it would be necessary to renew condenser tubes it was found that one of the thrust shafts and blocks had to be lifted clear to draw the tubes.

What might also be considered a mistake, though the designer would never admit it, was the fitting of a feed heater in the condenser, just over the top row of tubes. The builder stubbornly contended that there was an advantage and that the feed water was made materially warmer by being forced to take its path through the heater so placed. The writer had quite an argument with the builder over this same thing and still maintains that there was not the slightest advantage, as by no way could the feed water be hotter than the temperature of the vacuum carried.

Morpheus at the Throttle

By SEA FLAME

THE sidewheel steamer Eliza Anderson was a craft that plied on Puget Sound waters several years ago. She had a varied number of owners and was often run in opposition to established lines. She did not prove very much of a money maker and passed many months laid up. During one of her times of activity a funny accident happened to her.

At that period engineers stood long watches and at times, with a slow moving job, they would get sleepy. One of the old school, a Mr. Jerry McGill, was chief at the time of the accident alluded to. The Eliza was coming into Port Townsend wharf one summer Sunday morning about half-past four o'clock. At that time it was broad daylight, although the hours of sleep were not yet over.

As she ranged up to approach the wharf, the slow bell was rung, and to this no checking of speed resulted, so it was quickly followed by stop-and-back signals, but to these no attention was given. Poor old Jerry was "asleep at the throttle," worn out by an over-long vigil.

The onward course being unchecked, things happening quickly, the captain held her to a course in line with the wharf, no doubt hoping she would stop before reaching the inshore end. She didn't. She kept right on, and her bow plowed through the wharf office of Rothschild & Company, built out from the wharf, and through another small building, and finally stopped with her stem about six feet from the bedside of a peacefully sleeping couple, whose house had been split in two by the impact.

No one was injured, but it was certainly comical to see the mix-up. The old chief woke up about the time she commenced to break and enter, but before he got her checked, the fore end was piled high with broken partitions, windows, doors, desks, papers and duffle of a business office, together with an assorted lot of household furniture. The screams of the rudely awakened coupled added to the racket of splitting wood, and, taken altogether, the whole thing made quite an excitement. The captain, Sandy Jackson, sputtered and cussed, but the damage was done.

Just how the affair ended, and who was held responsible, the writer does not know. He does know, though, that in company with one or two other engineers he stood on the dock at the time and saw the whole action. He had only a few moments before come in on a tug and had gone up the wharf to see the Eliza make the landing, never dreaming that such an exciting one would ensue.

The Eliza ended her eventful career in a trip to Alaska during the Klondike rush, one of many other old vessels, as well as many new ones, which met their fate that way.

FREIGHTS AND CHARTERS

May 14, 1924.

Our last report was dated April 23. As regards grain space on the regular steamship lines from this coast to the United Kingdom and Continent, there is practically none to be had for May and June shipment and the rate is firm at 35/-. Some July space is being booked at 32/6, but the lines are holding off in anticipation of an improvement in rates through the expected movement of the large carry-over from the old wheat crop, together with new crop barley from this port, which they believe will result in rates being maintained at 35/- and possibly improved.

As regards barley, although early season reports pointed to a small crop on account of the scarcity of grain, the outlook now seems to promise better.

For full cargoes in wheat, we wish to report as follows: British stmr. Sethonia, North Pacific/United Kingdom or Continent, 35/-, May, June loading, Strauss & Co.; British stmr. Queen Alexandria, North Pacific United Kingdom or Continent, 35/-, June loading, Strauss & Co.; Japenese stmr. Liverpool Maru, North Pacific United Kingdom or Continent, 35/-, May, June leading; Norwegian stmd. Hellen, North Pacific/Mediterranean, 35-, June, July; Italian stmr. Nazareno, North Pacific Kingdom or Continent, 33/9, May, June; British stmr. Radnoshire, North Pacific United Kingdom, Continent, 33/9, May loading; British stmr. Benvenue, North Pacific/United Kingdom, Continent, 33/9, July; Italian stmr. Gerty, North Pacific/Mediterranean, 36/9, May loading, by Strauss & Co.

There has been no chartering in grain for the Orient, although it is reported that the Norwegian stmr. Storviken booked 5000 tons of flour from Astoria to Shanghai for account of the Astoria Flouring Mills at $5.25 a short ton.

For lumber for Australia Norwegian stmr. Kalfarli has been taken from Fremantle by J. J. Moore & Co., terms private, the same charterers having also taken Japanese stmr. Fuki Maru for two ports Australia, terms private, while the Norwegian motorship Hallfried has been chartered by W. L. Comyn & Co. for Sydney or Melbourne at the rate of $12.50; same charterers have also fixed a Japanese steamer for two ports Australia at $12.50, with the option of three ports at $13. German stmr. Wilhelm Hemsoth, only recently reported, was taken in January by J. J. Moore & Co. for three ports Australia, terms private.

There have been no full cargo fixtures reported in lumber for the West Coast of South America nor to Japan nor Africa; although for the latter destination G. W. Gates & Co. of Portland are reported as having fixed space for some 2,000,000 feet at $18.50, Capetown-Delagoa Bay Range.

There has been an easing off in the demand for lumber from the North Pacific to the Atlantic seaboard, and American tonnage, which was being promptly taken up at rates of $15 and even $15.50 per thousand feet, is now not demanding more than $14.50. The fixtures reported are as follows: British stmr. Tritonia, British Columbia, two ports north of Hatteras, $13.50, May loading, South Alberta Lumber & Supply Co.; American stmr. Deepwater, North Pacific, two ports north of Hatteras, $15, June loading; American stmr. Wm. N. Page, Grays Harbor and Columbia River, to two ports north of Hatteras, $15, Columbia Pacific Shipping Co.; American stmr. Romagne, Grays Harbor to north of Hatteras, $15.50; American stmr. Orient, North Pacific to New York, $15; American stmr. James B. Duke, Grays Harbor and Puget Sound to New York, $15; American stmr. Georgian, North Pacific to north of Hatteras, May-June. The rate on this fixture is not quoted.

The Norwegian stmr. Camilla Gilbert placed on berth from British Columbia for Antwerp from three to four thousand tons of her cargo consisting of zinc concentrates, at a reported rate of $6 per ton of 2240 pounds.

Steamer Isonomia is reported fixed for a full cargo of coal from Newcastle to Chile at 20/- per ton. American barkentine E. R. Sterling is chartered for a full cargo of nitrate from Chile to Honolulu at $4.50 per ton.

The following list of fixtures is reported in tankers from California ports to the Atlantic seaboard; American tanker Alameda, Los Angeles to Fall River, crude, 83c per barrel, May; American tanker Hagan, San Pedro to Fall River, tops, 83c, option loading at Avon, 86c, prompt; American tanker Baldbutte, California ports to Fall River, crude, 85c, May; American tanker Betterton, California ports to north of Hatteras, crude, 85c, June.

Steel stmr. Alvarado has been sold by Swayne & Hoyt to Sudden and Heitman, terms private; stmr. Hornet has been bought by the Hawaiian Meat Company at a reported price of $45,000, and stmr. Brookdale was bought by W. W. Mitchell & Co., Seattle, terms private.

PAGE BROTHERS, Brokers.

BOLINDER INSTALLATIONS

HENRY LUND & COMPANY, Pacific Coast distributors for Bolinder engines, with offices in the Marine building, San Francisco, report considerable activity in the Northern territory, where they recently made the following installations:

Troller Lilly—15 B.H.P., one cylinder, type B09, model "NG".

Halibut schooner Gladys—30 B.H.P., one cylinder, type B020, model "NG".

Halibut schooner Bolinder—50 B.H.P., two cylinders, type B015, model "NEI".

Halibut schooner Venus—50 B.H.P., two cylinders, type B015, model "NEI".

Halibut schooner Scandia—160 B.H.P., two cylinders, type R500, model "MI".

TugBoat Douglas 320 B.H.P., four cylinders, type R500, model "MII".

Tugboat Czar—350 B.H.P., four cylinders, type B050, model "NEII".

It is noteworthy that halibut schooners out of Puget Sound are gradually increasing in size and power of engines. One of the latest of these is the Scandia, which is illustrated on page 334. This vessel is 100 feet long by 21½ feet beam, has a speed fully loaded of 9 knots, and carries 140,000 pounds of halibut in addition to the crew, stores, and fuel oil.

A GOOD REPORT

According to a report recently submitted by the Bethlehem Shipbuilding Corp., all the yards of that corporation repaired during the year 1923, 2415 vessels of a tonnage of 22,427,000; on January 1, 1924, they had under construction, or under contract to build, for private shipowners, 14 steel vessels of a gross tonnage of 17,500.

MARINE INSURANCE

DEVELOPMENTS OF THE MONTH

By CHARLES F. HOWELL, Contributing Editor

DESPITE the solemn announcement of the lake hull underwriters of the New York market that "in view of the experience of the last several years it has been decided to adopt last year's rates and conditions and to leave rates for late sailings and matters of special forms to a special committee," the fact remains that this spring has seen one of the keenest struggles for this class of business in the recent history of lake underwriting. To serve inside interests of their own, one or two of the older offices, believing they had an unbreakable "half-Nelson" on the business, announced that they would cut rates as their judgment dictated. A strong group, opposed to such action, quietly agreed to maintain rates; and, as the rate-cutters lacked the facilities to take care of a great part of the fleet insurances, the result has been that the stand-patters are carrying as large lines as they did a year ago and at substantially better rates than their opponents. Before all the business had been safely gathered in, however, there was as animated a scramble for it as any one would want to see. Every day the special lake hull committee met and hammered away at the situation, and the only subject discussed on the street was that of lake coverages, who were getting them and what they were getting for them. The special committee was composed of the following: Hendon Chubb, chairman; S. D. McComb, W. J. Roberts, J. T. Byrne, Jr., and T. Leaming Smith.

"AND EVERY SOUL WAS SAVED"

A painting showing a thrilling rescue at sea in the North Atlantic in 1889, when the Atlantic Transport liner Missouri rescued more than 700 persons from the sinking immigrant ship Denmark.

Writing Coffee Risks

Brazil is seriously threatening the supremacy of the Java coffee trade with the United States. Importations from Java have been falling off steadily, while those from Brazil have reached a quantity record. The latter country has astonished the world with the fine results it has had in the culture of the transplanted Javanese berry, and it has developed the industry at the right moment, in view of the action of Javanese planters in turning from coffee production to that of rubber under the impetus of the high prices for rubber created by the war. In 1923 no less than 5,773,085 bags of coffee came to the United States from Santos, Brazil.

As may be imagined, there has been a keen competition among marine underwriters for this business. Money has been made in the insuring of coffee, but there are serious causes of damage attending its transportation, chiefly arising from sweat, fresh water, and country damage. An important factor in the coverage is the "skimming clause," which reads as follows:

"In case of damage by contact with sea water, the insurer to pay on the damaged portion the cost of skimming and the depreciation on the skimmings without reference to percentage or series."

The rate for shipments of coffee on regular line steamers from Brazilian ports is from 2 10 per cent to $1\frac{1}{4}$ per cent. Colombian coffee, from inland points on the Magdalena River, is rated at about 1 per cent. The product is generally shipped in bags, and the bags are packed very tightly in the hold of the steamer. When coffee is brought in contact with water it swells considerably. There have been instances where the sides of a vessel have actually been burst

open by the swelling of wet coffee.

Insuring Chilean Nitrate

Heavy importations of nitrate of soda have marked this year's foreign trade at Charleston, South Carolina. It is used extensively in the fertilization of cotton and tobacco fields. During one month of the present year no less than 44,000 tons of nitrate were brought into this country, which is believed to be a record.

There is great weight to this commodity, stowing in 32 feet, and in order to raise the center of gravity it has to be tiered up in the vessel. Because of this element of weight, sailing ships are regarded as poor risks in the transportation of nitrate. Underwriters find some very objectionable properties in it; it is soluble in water, forming a dangerous compound, also, when brought into contact with organic matter. It is subject to evaporation when in a damp place, and therefore it has to be kept as dry as possible.

At Chilean ports, nitrate is loaded entirely by lighters, and the following clause is used by underwriters in that connection:

Including all risks of craft, boats, and or lighters to or from the vessel upon whatever terms as to liability or otherwise the lighterman may be employed, each craft, boat, or lighter being deemed a separate insurance; any loss in craft, boat, or lighter is to be settled under this policy without reference to the liability of the lighterman under special agreement between assured and lighterman or otherwise, the assured transferring all rights against the lighterman to the underwriters.

The rate for this lighterage alone is usually as high as the rate for the entire ocean trip, because of the poor type of lighters used and the danger of overloading. Marine insurance policies usually include the standard nitrate clauses, providing the following coverage:

Warranted free from particular average, unless the vessel or craft be stranded, sunk, burnt, or on fire, or strike the ground, pier, quay, bridge, or against any other object, whether stationary or floating on the water, especially ice, or in collision (the collision or striking to be of such a nature as may reasonably be supposed to have caused the damage), or vessel put into port of distress and discharge cargo, or the damage be caused by water, resulting from bursting of hatches, and or from default or negligence of the crew. To pay landing, warehousing, forwarding and special charges, if incurred, as well as partial loss arising from transshipment, also to pay the insured value of any package which may be totally lost in loading, transshipment or discharge. General average payable as per foreign statement, or York and Antwerp rules, 1890.

Automobile Shipping Hazards

New records are being reached in the exportation of automobiles, with a consequent active competition for this class of business. In the passenger car market the leaders are Australia, Argentine, and British South Africa; Australia and Japan supply the heaviest demand for trucks.

The insurance rates vary according to the destination of the shipments, and are low considering the numerous claims arising from a variety of causes. One of the outstanding causes of damage has been that of rats and mice in the upholstery of the cars. It has also to be borne in mind that any damage, no matter how apparently trifling, is substantially reflected in the depreciation of the car; in most cases this reaches 40 per cent.

Insurance on automobiles is written with this clause:

Against all risks of transportation and navigation, including the risks of breakage, fresh water, theft and / or pilferage, excluding such risks as are excluded by the F. C. & S. and the Strikers' clauses. In case of loss or damage to any part of a machine consisting when complete for sale or use of several parts, the insurer shall only be liable for the insured value of the part lost or damaged. No claim to be paid unless amounting to twenty-five dollars ($25).

Coverage of Silk Shipments

An announcement has recently been made by the Admiral Oriental Line to the effect that that company is now carrying approximately 45 per cent of the Oriental silk importations to the United States. In illustration of this,, it is stated that not long ago three thousand bales of silk, valued at $4,000,000, was discharged from the President Grant at Seattle and sent to New York by special train. The President Jackson is credited with branging in six thousand bales, valued at $10,000,000, and the President Grant has a second record of five thousand hales of a valuation of $8,000,000. Silk documents can now be got to New York as quickly as the silk itself, through a saving of twelve hours in mail delivery at Seattle, effected by an airplane service at Victoria that takes over the mail sorted by sea mail clerks recently installed on the Admiral Oriental steamers.

These silk shipments are covered by the marine insurance policy against all risks, from the time they leave the warehouses in the Orient, during the course of transit by steamer to the Pacific Coast of the United States, and thence by rail to the point of destination in the interior. The rate has gotten down to 12½ cents, as the commodity is regarded by underwriters as excellent freight, receiving the very best of care in packing and handling. Because of the large values involved the shipments are brought forward on the highest class of steamers and sent across the continent via the fastest express freight so that interest charges may be reduced to the lowest point. There is, however, an uncomfortable feeling among underwriters that the rate is hardly

adequate to compensate for total loss and general average claims.

The Courts on Stranding

In recently deciding an appealed case of the Washington Iron Works versus The St. Paul Fire & Marine Insurance Company, the Supreme Court of the State of Washington delved deeply into the question of strandings and their effects upon the f. p. a. clause of the marine insurance contract, 222 Pac. Rep. 487. The respondent made a shipment of steel plates on the Julia Luckenbach from New York to Puget Sound via the Panama Canal, covering with the appellant's policy in the usual f. p. a. form. The effect of this insurance was to protect the respondent against total loss only except as the liability was enlarged by Clause 10, which contained the f. p. a. warranty. The vessel was stranded, it was alleged, in San Diego harbor en route, but was floated and resumed her voyage. Heavy weather was experienced further along, and the respondent's property was alleged to have been damaged by the shifting of the cargo. Damages were claimed from the insurance company on the ground that the f. p. a. warranty was deleted by the San Diego stranding, thus opening the general terms of the policy and entitling the respondent to recovery for the partial loss sustained later.

The court maintained that the f. p. a. clause has always been construed to mean that if the stranding takes place, whether before or after the cargo receives damage, the clause is stricken and the policy is construed as though it had never been inserted. The one question of interest, therefore, was did the vessel actually strand in San Diego harbor. Numerous authorities were cited. Quotation was made of the case of Kingsford versus Marshall, 8 Bing. 458, in which it was held:

The mere taking of ground, therefore, in a tide harbor in the place intended by the master and crew, or the proper officers of the harbor, cannot, upon any principle of construction or common sense, be held to constitute a stranding. What more, then, is necessary? We think a stranding cannot be better defined than it has often been in several of the decided cases, viz., where the taking of the ground does not happen solely from those natural causes which are necessarily incident to the ordinary course of the navigation in which the ship is engaged, either wholly or in part, but from some accidental or extraneous cause.

Applying this test to the case in hand, the decision of the court was that the mishap to the Julia Luckenbach was not the result of the intention of the master, and was wholly or in part the result of some accidental or extraneous cause. A quotation was made from Templeman on Marine Insurance, thus:

The grounding must have been accidental or unusual. If the taking of the ground was in an accustomed place and manner, as, for instance, in a tidal harbor, then there is no stranding.

Gow, on Insurance, was cited as stating:

The stranding must be fortuitous, accidental—not part of the customary navigation on the voyage insured.

The court cited the holding of Lord Ellengorough, in Harman versus Vaux, 3 Camp, 429, where it was maintained:

It is not merely touching the ground that constitutes a stranding. If the ship touches and runs, the circumstance is not to be regarded. There she is never in a quiescent state. But if she is forced ashore, or is driven on a bank, and remains for any time upon the ground, this is a stranding, without reference to the degree of damage she thereby sustains.

Citation was also made of the case of Amok Gold Mining Company versus Canton Insurance Office, 36 Cal. App. 265, 171 Pac. 1098, where the court held:

The meaning of the word "stranded" is well settled. . The vessel must remain stationary for a time. Stranding implies a settling of the vessel, some rest or interruption of the voyage under extraordinary circumstances. If the ship merely touch and go, she is not stranded, but a settling of the ship on the land, be it rocks or bar or shore, so that she be stationary for even a brief period, is a "stranding."

The final authority adduced was the case of Lake versus Columbus Insurance Company, 13 Ohio 48, 42 Am. Dec. 188, in which the Supreme Court of Ohio said:

To constitute a stranding, the vessel must be stationary some time. In this case it must have remained "aground," upon the rock or stump, which caused the bilging and loss, a longer or shorter period, so as to check the navigation and interrupt the voyage. A mere instantaneous stoppage does not constitute a stranding.

The Julia Luckenbach was, on these grounds, held by the court to have been stranded, and the judgment of the trial court was affirmed. With regard to the accidental nature of the occurrence, the final words of the court were interesting:

That it was accidental appears by the fact that it happened by chance, without expectation, and not according to the usual course of things. When a master attempts to take his vessel to a certain point which he considers can be reached without touching bottom, and the event proves he was mistaken, the grounding is accidental.

News in Eastern Offices

New officers have been elected by the Maritime Association of the Port of New York as follows: president, John Dowd; vice-president, George W. Lethbridge, of the well known inland marine insurance office of Lethbridge & Cornwell; treasurer, Cornelius H. Callaghan. The new directors are: Thomas F. Baker, Harry D. Cox, Fred B. Dalzell, Joseph J. Glatsmayer, Frederick E. Hasler and Joseph Juluer.

Forrest E. Single, of the admiralty firm of Bigham, Englar & Jones, who has been in Japan for several months in the interests of American underwriters involved in losses arising out of the Japanese earthquake and fire, arrived home on May 5. He believes American insurers will be liable for something like $12,000,000 or $15,000,000.

William B. Vanderhoof, New York marine manager of the Boston Insurance Company, spent three weeks in a trip across the Atlantic and back during May. He recently sustained the loss of his father, who was one of the best known importers and exporters in the New York market.

The American & Foreign Insurance Company, owned by the British & Foreign, has had its charter amended, permitting the writing of fire insurance as well as marine. Its fire department will be handled by Frederick B. Kellam, vice-president and director of the American & Foreign.

Newman & MacBain, Inc., have been appointed inland marine agents of the Fidelity-Phoenix for the New York metropolitan district.

William H. McGee & Company, Inc., have opened a branch office at Houston, Texas, with William J. Grill in charge.

Douglas G. Fish has been elected to membership in the Board of Underwriters of New York as an additional representative of the Union Hispano, in the place of William E. Vanderhoof, who recently resigned from that company.

President Stevenson Taylor of the American Bureau of Shipping has been awarded the Conspicuous Service Cross by the New York legislature for work in the World War.

At the recent annual meeting of the Association of Marine Underwriters of the United States, all the officers were reelected, as was the entire executive committee. All standing committees were reappointed.

The Union Hispano has amicably terminated its association with the Boston Insurance Company and has moved to its former offices at 31 South William street.

C. H. Mayo and R. W. Wilson have been appointed agents in the marine department of the Automobile. Mr. Mayo goes to the Dallas branch office and Mr. Wilson to the St. Louis branch.

William-Ebbets Lowe, formerly active in marine insurance brokerage in New York City, died recently at the age of eighty. He was, at one time, a member of the firm of Johnson & Higgins.

"Metal Mike" on the Seven Seas

THE Sperry Gyro-Pilot (automatic steering device), known as "Metal Mike," has given such a good account of himself that an order has been placed for equipping the remainder of the Shipping Board passenger liners.

Installation is now going forward on the President Lincoln, operated from San Francisco to the Orient by the Pacific Mail Steamship Company, to be followed the last of this month by an installation on the President Grant of the Admiral Oriental Line.

The President Harding and the Republic of the United States Lines recently sailed steered by "Metal Mike," and he has also stepped aboard the Western World of the Munson Line and is preparing himselfg to take over the job of steering her on the long run to South America and return.

Installation has just been completed of Gyro-Compass and Gyro-Pilot on the tanker Harvester of the Texas Company. The Matsonia of the Matson Line, plying between San Francisco and the Hawaiian Islands, is turning her wheel over to the Gyro-Pilot.

Reports from abroad show that a number of the diesel freighters building in England for service to the Far East and Australia will also have the Sperry Gyro-Compass and Gyro-Pilot. "Metal Mike," through his consistent work, has therefore quickly won his way in the seafaring field and is taking over the steering of all classes of ships.

TRADE NOTE

The Bethlehem Shipbuilding Corporation, Ltd., has received an order for a complete set of Bethlehem-Dahl fuel oil burning apparatus to be installed on the Red "D" Line steamship Maracaibo, which is now being reconditioned at the plant of the Federal Shipbuilding Company,

SHIPBUILDING AND SHIP REPAIRING

Catalina Launched

The new excursion steamer Catalina building for the Wilmington Transportation Company slid down the ways at the plant of the Los Angeles Shipbuilding & Drydock Corporation, San Pedro, on Saturday, May 3. This vessel was fully described in the April issue of Pacific Marine Review, but we will repeat the following principal particulars: Length over all 301 feet 7 inches, breadth 50 feet, depth 21 feet. The vessel will have a carrying capacity of 3000 persons. The propelling machinery will consist of two sets of triple expansion engines of 4000 horsepower driving on twin screws. She will have a speed of 16 knots.

The Catalina will be fully engined and turned over to her owners by July 1, when she will immediately enter service between Los Angeles Harbor and Catalina Island. Prominent among those present at the launching were J. H. Patrick, president; D. M. Rent, vice-president and general manager; F. H. Hildebrand, marine superintendent; David Fleming, vice-president, all of the Wilmington Transportation Com- Fred L. Baker, chairman of the board; Erle M. Leaf, president; L. E. Caverly, chief engineer; L. R. McFie, general manager; and A. T. Hifield, general superintendent of the shipbuilding company; Thomas J. Farley, technical advisor of the Wrigley interests; Mayor Cryer of Los Angeles, and prominent harbor and city officials.

Supreme Court Decision

The United States Supreme Court on May 12 handed down a decision that is favorable to the Skinner & Eddy Corporation of Seattle and leaves that concern free to press its $9,000,000 suit against the Emergency Fleet Corporation. By its decision the Supreme Court removed the entire proceedings from the jurisdiction of the Federal Court of Claims. By its decision the Supreme Court removed the entire proceedings from the jurisdiction of the Federal Court of Claims.

The Skinner & Eddy Corporation claims that $9,000,000 is due it for ships built by its Seattle yards for the Shipping Board during the war. The decision is in line with the former rulings of the Supreme Court that the Emergency Fleet Corporation is a private corporation and can

be sued in the regular courts. The shipyard company will now press its civil suit to a termination.

The difference between proceedings in the Federal Court of Claims and the regular courts is this: If the Court of Claims allows such a claim as the one presented by the Skinner & Eddy Corporation, it is necessary to get an act of Congress appropriating the money to pay the claim. In the regular courts a judgment against the Emergency Fleet Corporation can be collected the same as a judgment against any other private corporation.

Federal Shipbuilding Co.

Just as we are going to press we are in receipt of a telegram from the Federal Shipbuilding Company, of Kearny, New Jersey, reporting the extent of damage caused by a fire on May 18 as amounting to about $300,000. On Sunday, May 18, flames burst from a building containing mold loft and joiner shop on tht second floor, and these departments, together with the roof of the building, were destroyed. On the next day, another fire destroyed the roof on the machine shop in a separate building.

The Federal Shipbuilding Company states that the facilities will be restored as quickly as possible, and that work has been transferred to other departments in the yard and there will be no suspension of activities.

Association Meeting

The Atlantic Coast Shipbuilders' Association held its seventh annual meeting in Philadelphia, May 12. Harry A. Magoun, senior vice-president of the New York Shipbuilding Corporation, was re-elected president; Charles P. Wetherbee, engineering director of the Bath Iron Works, was re-elected vice-president; and J. Harry Mull, president and general manager of the William Cramp & Sons Ship & Engine Building Company, was re-elected treasurer.

The meeting was addressed by a number of shipbuilding executives, taking the form of a round-table discussion.

New Process for Lining Tail Shafts

By R. Z. DICKIE

SINCE the use of the screw propeller in marine work, brass liners have been used for bearings and this practice has been more or less the accepted method. This method consists of casting brass liners and boring them out above 1 64 inch smaller than the shaft that is to be covered, and then shrinking them in place. After they have been shrunk and doweled in place they are turned on the shaft centers to the proper bearing size.

This custom has been used for many years and very little improvement has been made along these lines. Marine shafting covered in this manner seems to have an average life of from 8 to 10 years, after which time it will show signs of corrosion, and when this occurs the United States Inspectors of Hulls and Boilers, or the marine insurance surveyors, may order them replaced with new shafting.

With the object of trying to improve this situation, a series of experiments were made to develop a process for lining steel shafting and at the same time to make it proof from electrolysis and corrosion.

Many difficulties had to be overcome and what seemed to be an ad-

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Work in Prospect

We learn through the San Francisco Chamber of Commerce that the International Commission Company, Nogales, Arizona, has an inquiry for from six to ten lighters, 5 by 75 by 24 feet, 100 tons capacity, and an oil-burning tugboat capable of towing two 100-ton loaded lighters in a quiet bay. The lighters must be of the platform type — that is, entirely closed.

The city of Los Angeles on May 6 approved a bond issue of $400,000 for the purchase or construction of a fire boat for Los Angeles Harbor.

According to reports received from the East, a corporation is being planned with a capitalization of $9,000,000 to build and operate a fleet of eighteen diesel-electric boats for the New York State barge canal. These vessels will be of a type that can be used both on the canal and the Great Lakes and will probably operate between New York and Chicago. They will be 258 feet long, 42 feet beam, and 18 feet depth.

The New York & West Indies Mail Steamship Company has opened offices at 17 Battery Place, New York, and proposes to build three or four combination passenger and freight vessels for the New York-West Indies run.

The Grand Trunk Western Railway Company, Montreal, is reported as in the market for two car ferries of the three-track type for service between Ludington and Milwaukee.

The Mitchel Steamship Company of Cleveland, Ohio, is also mentioned as contemplating the construction of two ore steamers of about 14,000 tons deadweight to cost about $1,000,000 each.

Another contemplated ship construction job is that of a new ferry to cost about $750,000 for the Detroit & Windsor Ferry Company, Detroit, Michigan.

Bids have been asked by the New York Steamship Company for the construction of a 600-foot dock equipped with modern freight handling machinery.

Recent Contracts

Bethlehem Shipbuilding Corporation, Ltd., Harlan Plant, has an order for two carfloats for the Erie Railroad, 325 feet long of 1030 gross tons.

Nashville Bridge Company, Nashville, Tenn., has been awarded contract by T. L. Herbert & Sons for a dredge boat hull 110 feet long, 30 feet beam, 6 feet draft.

Federal Shipbuilding Company has been awarded the contract for the Southern Pacific Company's new freight steamer for coastwise trade. The vessel will be 433 feet over all, 58 feet molded beam, 37 feet draft, and will have a deadweight tonnage of 7960.

Spedden Shipbuilding Company, Baltimore, has an order for a steel hull tugboat for the Grace Line, Inc., New York City. The tug will be 76 feet 6 inches over all, 19 feet beam, and 10 feet depth, and will be equipped with 320 horsepower Ingersoll-Rand diesel engine.

Chas. Ward Engineering Works has an order for a quarter boat 106 feet long and 26 feet beam for the U. S. Engineers Department, Huntington, W. Va.

Keel-layings

Barge No. 4, Pacific Portland Cement Co., A. W. de Young, shipbuilder, Alameda, Calif., Apr. 18.

Steel oil barge, Standard Oil Co., Los Angeles Shipbuilding & Drydock Corp., Apr. 18.

Sternwheel towboat, Marietta Manufacturing Co., May 1.

Deck barge, U. S. Govn., Louisville, Nashville Bridge Co., Apr. 17; deck barge, Greenville Stone & Gravel Co., Apr. 29.

Lookout, towboat, U. S. Engineers, Nashville, Chas. Ward Engineering Works, Apr. 17.

Launchings

Catalina, excursion steamer, Wilmington Transp. Co., Los Angeles Shipbuilding & Drydock Corp., May 3.

Six steel barges, U. S. Engineers, Portland, Ore., Todd Drydock & Construction Corp., Tacoma, May 2.

Five oil barges, Standard Oil Co. (N. J.), Bethlehem Shipbuilding Corp., Sparrows Point, Apr. 2, 8, 11, 24, and 29.

Memphis, scout cruiser, U. S. Navy, Wm. Cramp & Sons Ship & Engine Building Co., Apr. 17.

Benson Ford, bulk freighter, Ford Motor Co., Great Lakes Engineering Works, Apr. 26.

Deliveries

Ten Coal barges, Carnegie Steel Co., American Bridge Co., during April.

Trenton, scout cruiser, U. S. Navy, Wm. Cramp & Sons Ship & Engine Building Co., Apr. 15.

Priscilla, bulk oil stock, New York Shipbuilding Corp., and two self-propelled oil barges for Standard Transp. Co., during April.

Tacoma, steel hull, Cincinnati Pomeroy & Charleston Packet Co., May 17.

Repair Awards

General Engineering Company of Alameda, California, recently received contract for installing ice boxes

the Shipping Board liner President Wilson on a bid of $14,600.

This company was also low bidder on repairs to the Shipping Board freighter Pawlet, one of the "mud-cat" fleet, which will be prepared for spot service. Bids submitted May 7 were: General Engineering Corporation, $26,420; Bethlehem Shipbuilding Corporation, $29,227; Hanlon Drydock Company, $29,892; Moore Dry Dock Company, $30,105.

* * *

Commercial Iron Works, Portland, Oregon, was awarded contract for complete and permanent repairs to the Dutch motorship Dinteldyk on a bid of $54,504.

* * *

Todd Dry Docks, Inc., Seattle, on a bid of $20,000 was awarded the contract for repairing the freighter Admiral Rodman, which recently went ashore in Puget Sound.

* * *

Bethlehem Shipbuilding Corporation, San Francisco, submitted low bid on reconditioning for lumber trade of the steamship Alvarado, recently purchased by Sudden & Heitman from Swayne & Hoyt. The Bethlehem bid was for $24,490. Other bids submitted were: $24,680 by the Main Iron Works; $24,820 by Hanlon Drydock Company; $25,550 by the General Engineering Corporation; $26,755 by Moore Dry Dock Company; and $27,780 by the United Engineering Company.

Bethlehem was also low bidder on repairs to the Army transport Cambrai—$8591 and 7 days.

* * *

The largest repair job awarded on the Pacific Coast during May was that of damage repairs to the Admiral liner Ruth Alexander on a bid of $57,873, by Moore Dry Dock Company, Oakland. The Ruth Alexander went ashore the latter part of April near Eureka, California. She has a hole in her bottom. The only other bid submitted for this work was that of the Bethlehem Shipbuilding Corporation for $59,764.

Moore Dry Dock Company was also awarded contract for voyage repairs to the Dollar Line's round-the-world steamer President Van Buren for $1824.

* * *

Hanlon Drydock Company, Oakland, was lowest bidder on damage repairs to the Holmes Eureka Lumber Company's steam schooner Katherine. Bids submitted were: Hanlon, $14,792 and 20 days; Bethlehem, $16,780 and 22 days; General Engineering Corporation, $17,500 and 21 days; and Moore Dry Dock Company, $18,965 and 25 days.

Shipyard Notes

The heavy duty power tender Highway was launched at the yards of the N. J. Blanchard Boat Company, Lake Union, Seattle, May 1, for the United States Bureau of Roads. The new vessel will be used in carrying supplies in connection with the building and repair of roads in Alaska. She is 70 feet long, of staunch construction, and will be powered with a 90-horsepower engine. The cost of the Highway will be $27,000.

* * *

An 86-foot power yacht to cost $40,000 is building in the yards of John Martinolich in Dockton, Vashon Island, Puget Sound, for the Alaska Coast Hunting & Cruising Company of Eugene, Oregon. She will be equipped with a 110-horsepower diesel engine. She will be used by big game hunters and other sportsmen. George Eastman of the Eastman Kodak Company, Rochester, New York, has taken the first charter of the yacht, which will be turned over to him on completion in June.

* * *

Engberg's Electric & Mechanical Works, St. Joseph, Michigan, is supplying the Great Lakes Engineering Works, Cleveland, Ohio, with six 15-kilowatt generating sets; three sets are to be installed in the new lake freighter building for the Franklin Steamship Company and three to be installed in the new steamer building for the Columbia Steamship Company.

* * *

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vantage in one way would cause trouble in another. Finally a metal was found that served to fill the requirements and the compression factor would be increased or diminished at the will of the operator.

A series of shallow holes are drilled in the steel shaft in the way of bearings, with an expanding tit drill so that besides amalgamating the bearing metal with the shaft liner metal, this material automatically dove-tails itself to the shaft during the application. This process is now being patented.

The cost of these linings, as compared with the old method, is now being determined by practical experiment, and the indications are that the new method will be less expensive.

The present problem of converting the steam turbine-driven Shipping Board vessels to diesel power required larger tail shafts, and as the lining by the new process need only be about ¼-inch thick, a larger diameter steel shaft can be used without changing the stern tube or bearings.

Some of the advantages may be enumerated as follows:

1. Probable lower first cost;
2. Shaft will be corrosion proof and have longer life;
3. In case of new work, smaller inside diameter bearings can be used, thus cutting the cost somewhat;
4. No finish machine work required on tail shaft except propeller fit and coupling flange;
5. Characteristics of lining metal can be made to suit any bearing either of lignumvitae, babbitt, or brass;
6. Larger diameter shaft may be fitted on account of thinner liner;
7. Linings can be renewed at any time very quickly and thus avoid loss of shafting.

Progress in Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
UNION PLANT
Potrero Works

Purchasing Agent: O. W. Streett.

No. name, built 5322, cargo steamer; Hawaiian Meat Co., Honolulu, 190 [illegible] O.A.; [illegible] loaded draft; 12 mi. speed; TE engs.; 2 water tube boilers.

Barge No. 4, Pac. Portland Cement Co., San Francisco; 106 LBP; 32 beam; 6 ft. 9 in. loaded draft; keel Apr18 24; launch May31, 24, est; deliver June1, 24, est.

Barge No. 5, sister to above; keel Apr18, 24, est; launch May31, 24, est; deliver June1/24, est.

HANLON DRYDOCK & SHIPBUILDING COMPANY
Oakland, Calif.

Purchasing Agent: R. Barker.

Dan F. Hanlon, hull 89, steam schr D. J. Hanlon; 2500 DWT; 1400 IHP engines; 2 B&W boilers; launched Mar17/24; deliver May15/24, est.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
San Pedro, Calif.

Catalina, hull 42, excursion stmr, Wilmington Transp. Co.; 285 LBP; 52 beam; 14 loaded draft; 16 loaded speed; twin screw 3-cyl TE engs; 3600 IHP; 4 B&W boilers; keel Dec26/23; launched May3 24; deliver July1, 24, est.

No name, hull 43, steel oil barge, Standard Oil Co. (Calif.); capacity 3600 bbls; 110 LBP; 37-6 beam; 8 depth; keel Apr18 24, launch and deliver June9 24, est.

THE MOORE DRY DOCK CO.
Oakland, Calif.

Purchasing Agent: N. Levy.

No name, hull 162, oil barge, Associated Oil Co.; S. F.; 140 LBP; 30 beam; 7-6 loaded draft; Pacific diesel engs; 220 BHP; keel May12 24, est; launch Aug28 24, est; deliver Sept10 24, est.

NAVY YARD
Puget Sound

Medusa, repair ship for government; 460 L BP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng, 7000 IHP; 2 WT express type boilers; 10,000 tons displ; keel Jan 27/20; launched April6 23; deliver March15, 24, est.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons displ; keel April1 21; delivery April 25, est.

JAS. ROBERTSON SHIPYARD
Alameda, Calif.

[illegible] San Rafael, ferryboat, Redwood San Rafael Ferry Co.; 172 LBP; 38 beam; 9 loaded draft; 15 knots speed; 2 IHP across comp [illegible]; 4 Scotch boilers, 9-6; keel Dec10/23; launched May17 24.

W. F. STONE & SON SHIPBUILDING COMPANY
Oakland, Calif.

Emerald, hull 51, yacht, for F. A. Hyde; 50 LBP; 14 beam; 6 loaded draft; launched Apr 29; deliver May1/24, est.

No name, hull 52, tug, Daniel Const. Co.; 65 LBP; 17 beam; 8 loaded draft; 150 IHP diesel eng; deliver May1/24, est.

Hull 53, barge, Naknek Packing Co.; 65 LBP; 24 beam; deliver Apr1/24, est.

PRINCE RUPERT DRY DOCK & SHIPYARD
Prince Rupert, B. C.

Two cruiser hulls, 60 ft, for Dominion government Fisheries Service; deliver Mar30/24, est.

TODD DRYDOCK & CONSTRUCTION CORPORATION
Tacoma, Wash.

Six steel barges, hulls 37-42 inc., U. S. Engineers, Portland; 120x34x7-6 feet; launched May 2 24.

No name, hull 43, passenger and freight stmr, Southern Pacific Co.; 445 LOA; 57 beam; 25 loaded draft; 16 knots speed; 7000 DWT; keel Feb26 24; launch July19/24, est.; deliver Nov/24, est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty coal barges, Carnegie Steel Co.; 175x26x11, 10 delivered.

Nineteen barges, U. S. Engineers, Louisville, Ky.; 110x26x6-6; deliver July 24, est.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft; deliver 1924, est.

Sixteen barges, U. S. Engineers, Louisville, 110x26x6-6; deliver Oct1/24, est.

Eight barges, U. S. Engineers, Florence, Ala.; 120x30x7; deliver July and Aug 24.

Fifteen barges, Amer. Steel & Wire Co., Pittsburgh; 100x26x9-3; deliver 1924.

Twelve barges, Tenn. Coal, Iron & R. R. Co.; 140x26x8-6; deliver summer 1924.

THE AMERICAN SHIP BUILDING COMPANY
Lorain, Ohio

W. H. Gerbaulet, vice-president and director of purchases.

Greater Detroit, hull 795, paddle stmr, Detroit & Cleveland Nav. Co.; 535 LBP; 98 beam; 16 loaded draft; 20 mi loaded speed; 3 cyl comp engs, 10,000 IHP; 6 SE and 3 DE Scotch boilers, 14x20; keel Feb10/23; launched Sept14/23; deliver spring 1924.

Greater Buffalo, hull 786; sister to above; keel May2/23; launched Oct27/23.

Henry Ford II, hull 788, bulk freighter, Ford Motor Co.; 590 LBP; 62 beam; 20 loaded draft; 13 loaded speed; 12,000 DWT; 3300 IHP; Doxford diesel engs; keel Dec10/23; launched Mar 1, 24.

BATH IRON WORKS, LTD.
Bath, Maine

Purchasing Agent: J. L. P. Burke.

Light vessel 111, hull 92, second-class light vessel, U. S. Dept. of Commerce; 109-6 LBP; 30 beam; 14-4 loaded draft; 9½ speed; comp eng; 400 IHP; 2 Scotch boilers, 10-6x11-5; keel Aug21/23.

Aras, hull 96, yacht for Hugh J. Chisholm; 118-4 LBP; 18-6 beam; 5-6 loaded draft; 15 mi loaded speed; two 6-cyl gas engs, total 1HP 400; keel Dec. 23; launched Mar17/24; deliver June1/24, est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT
Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N.

Massachusets, hull 1400, battleship U.S.N.; to be scrapped.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT
Wilmington, Del.

Hull 3489, U. S. Army; keel Dec8/23; launched Feb2 24.

Hull 3490, carfloat, C. R. R. of N. J.; 325 LB P., 38-6 beam; 1030 gross tons.

Hull 3491; same as above.

Hull 3492, carfloat, Erie Railroad; 325 LBP; 38-6 beam; 1030 gross tons.

Hull 3493, carfloat, sister to above.

BETHLEHEM SHIPBUILDING CORPORATION, SPARROWS POINT PLANT
Sparrows Point, Md.

Alexander Hamilton, hull 4217, passenger vessel, Hudson River Day Line; 325 LBP; 76 beam over guards; 13-8 deep; 1 TE eng, inclined, 3500 HP; 2 single and 2 double ended boilers; keel Apr2 23; launched Oct20/23.

Boston, hull 4218, passenger vessel Eastern

Steamship Co.; 385 LBP; 72-6 beam; 23-9 molded depth; twin screw turbine engs, 6400 HP; 6 Scoteb boilers; keel Mar13/23; launched Oct27/23; deliver Aor15/24, est.

New York, hull 4219, sister to above; keel Apr3/23; launched Jaol2/24; deliver May 15/24, est.

Hull 4222, oil barge, Standard Oil Co. (N. J.); 136 LOA; 23 molded beam; 5-6 depth; keel Feb 11/24; launched Apr2 24.

Hull 4223, sister to above; keel Feb11/24; launched Apr.8/24.

Hull 4224, sister to above; keel Feb11/24; launched Apr11/24.

Hull 4225, sister to above; keel Feb15/24; launched Apr24/24.

Hull 4226, sister to above; keel Feb15/24; launched Apr29/24.

Hull 4227, sister to above; keel Feb15/24; launch Apr/24, est.

Hull 4228, barge, Hudson River Day Line. 100x18x16 ft; keel Mar13/24.

Hull 4229, sister to above; keel Mar13/24.

CLINTON SHIPBUILDING & REPAIR COMPANY

Philadelphia, Pa.

No name, hull 45, oil barge, City of Phila.; 88 LBP; 30 beam; 8 loaded draft; keel June /24, est; launch July/24, est; deliver Aug/24, est.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Wig Wag, hull 2744, D. cruiser, H. S. Borden; 62x10-6; speed 30 mi; two 300 HP Speedway engs.

Hulls 2755-56, 26-ft tenders for Cox & Stevens.

Hull 2757, runabout, Sidney A. Smith; 60 HP Speedway engs.

Hull 2763, 45-ft cruiser, C. S. Heinz; 180 HP Speedway engs.

Hull 2764, 30-ft cruiser, H. W. Hanan.

Hull 2765, 34-ft play boat, J. F. Brown; 150 HP Speedway engs.

Hull 2766, 60-ft cruiser, R. C. Reynolds; 2 180 HP Speedway engs.

Hull 2767, 40-ft cruiser, F. S. Shitten; 180 HP Speedway engs.

COLLINGWOOD SHIPBUILDING COMPANY

Collingwood, Ontario

Royalton, hull 73, bulk freighter, Matthews Steamship Co.; 536-6 LBP; 58 beam; 31 molded depth; 13,000 DWT; 13 mi. loaded speed; 2800 h.p. TE engs; 2 Scotch boilers, 14-10-9; keel Dec31/23; launch Aug24/24, est; deliver Sept 15/24, est.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.

Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.

Trenton, hull 501, scout cruiser, U.S.N.; keel Aug.20; launched Apr16/23; delivered Apr15,24.

Marblehead, hull 502, scout cruiser, U.S.N.; keel Aug4/20; launched Oct9/23; 82.3 per cent comp. May1/24.

Memphis, hull 503, scout cruiser, U.S.N.; keel Oct4.20; launched Apr17/24; 67.5 per cent comp. May1/24.

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

No name, hull 61, yacht, builder's account; 98 LBP; 15 beam; 6 draft; 14 speed; Standard gas engine; keel June 28/22; launched Aug 6/23; delivery June1/24, est.

Reomar III, hull 70, R. E. Olds, 100 LBP; 18-6 beam; 4 loaded draft; diesel eng, 250 HP; keel Sept1/23; launched Nov15/23; deliver June 1/24, est.

Two steel car floats, Erie R. R.; 186 long; 34 beam; 8 depth; launch Apr12/24, est; deliver June25/24, est.

No name, hull 76, yacht, Aaron De Roy; 62 LBP; 13-6 beam; 4 loaded draft; 160 IHP gas engs; keel Mar5/24; launch June25/24, est; deliver July15/24, est.

DRAVO CONTRACTING COMPANY

Pittsburgh, Pa.

Hulls 284-285, inc, 2 steel dump scows, builder's account.

Hulls 293-306, inc., 14 steel barges, Mississippi River Commission, Memphis; 430 gross tons each.

Hulls 311-313,inc, 3 steel dump scows, U. S. Engineers, Louisville; 127 tons each.

Hull 317, derrick boat, U.S. Engineers, Huntington, W. Va.; 100 gross tons.

Hull 318, steel hull for sand dredge; Mississippi River Commission, Memphis; 78 gross tons.

Hulls 319-327, inc, 9 steel derrick boat hulls; 115 gross tons each; for U.S Engineers, Louisville, Ky.

Hulls 328 and 329, 2 dump scows, U. S. Engs., Chicago; 127 gr tons ea.

Hulls 330-331, 2 steel sand and gravel barges, Empire Limestone Co., Buffalo.

Hull 332, steel barge, U.S Engineers, New Orleans; 120x30x7; 430 tons.

Hull 333, sand digger; Ohio River Sand Co., Louisville; 155x42x7-6; 430 tons.

Hull 334, sand digger, Keystone Sand & Supply Co.; 155x42x7-6; 430 tons.

Hull 335, steel work boat, Second Pool Coal Company.

DUBUQUE BOAT & BOILER WKS.

Dubuque, Iowa

Hulls 70 to 74, inc., oil barges, U.S. Engineers, Rock Island; 100 LBP; 30 beam; 6 loaded draft.

Hulls 75-76, 2 oil barges, U.S. Engineers, Cincinnati; 100 LBP; 30 beam; 6 loaded draft.

Hull 77, hull for towboat, U.S. Engineers, Nashville; 80 LBP; 20 beam; 4-6 loaded draft.

FEDERAL SHIPBUILDING CO.

Kearny, N. J.

Purchasing Agent: R. S. Page.

Hull 79, steel oil barge, Mexican Pet. Co.; keel Mar31/24.

Hull 80, sister to above.

GREAT LAKES ENGINEERING WORKS

River Rouge, Mich.

Purchasing Agent: Chas. Short.

Benson Ford, hull 245, bulk freighter, Ford Motor Co.; 586 LBP; 62 beam; 20 loaded draft; 13 mi speed; 13,500 DWT; 3300 HP Doxford engs; keel Nov26/23; launched Apr26/24; deliver July1/24, est.

Hull 247, bulk freighter, H. K. Oakes, Franklin S. S. Co., Cleveland; 612 LOA; 586 LBP; 62 beam; 32 depth; 20 loaded draft; 13,500 DW T; 12 mi speed; keel Feb25/24; launch Aug1/24, est; deliver Oct1/24, est.

No name, hull 248, bulk freighter, Columbia S. S. Co., Cleveland; 618 LOA; 592 LBP; 62 beam; 32 depth; 20 draft; 13,500 DWT; 12½ mi speed; keel June15/24, est; deliver Mar1/25, est.

GREAT LAKES ENGINEERING WORKS

Ashtabula, Ohio

Hull 318, dump seow, Great Lakes Dredge & Dock Co.; 181 LOA; 40 beam; 12 loaded draft; 1000 yards capacity; keel Mar15/24; launch May15/24, est; deliver June1/24, est.

Hull 319, sister to above; keel Mar15/24; launched May25/24, est; deliver June15/24, est.

HOWARD SHIP YARDS & DOCK COMPANY

Jeffersonville, Ind.

Purchasing Agent: Jas. E. Howard.

Steel tow boat; 140 long; 32 beam; 6½ depth hold.

Two steel river boats, U.S. government.

No name, Algiers Public Service, Inc., New Orleans; 150 feet 6 inches long.

No name, ferryboat, sister to above.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Pere Marquette 21, hull 209, car ferry, Pere Marquette Ry. Co.; 348 LBP; 56 beam; 16 loaded draft; 14 mi loaded speed; 2 sets TE engs; 2750 total IHP; 4 Scotch boilers, 134x6x11; 18 lbs. pres; keel Oct1 23; launched Mar18 /24; deliver May/24, est.

Pere Marquette 22, hull 210, sister to above; keel Dec20/23; launch summer/24.

Hull 211, steel barge, War Dept. U.S.gov.; 175 ft long; 40 ft molded beam; 11 ft 0 in molded depth, keel Mar28/24.

Hull 212, steel tug, Great Lakes Dredge & Dock Co., Chicago; 75 ft long; 21 ft molded beam; 11 ft molded depth; 300 IHP Fairbanks-Morse CO engs; keel Jan12/24; launch Apr7/24, est.

Hull 213, sister to above; keel Jan19,24; launch Apr7/24, est.

MARIETTA MANUFACTURING CO.
Point Pleasant, W. Va.

Purchasing Agent: C. C. Wilhelm.

Sailor, hull 137, towboat, Jones & Laughlin Steel Corp.; 165 LBP; 36 beam; 7.6 depth; 105 gross tonnage; 16x32x8 ft Tandem comp engs, western river return tubular boilers; keel Oct 1/23; launched Mar28 24; deliver June15/24, est.

No name, hull 138, sternwheel towboat; 125x 30x5-2; tandem comp engs; Western rivers return tubular boilers; keel May1 24.

No name, hull 139, sister to above.

MIDLAND BARGE COMPANY
Midland, Pa.

Purchasing Agent: Jack Neal.

Hull 32, maneuver boat hull, U.S Engineers, Huntington, W. Va.; 60 LBP; 26 beam; 83 DW T; keel Jan1,23; launch Apr10,24, est; deliver May1/24, est.

Hull 33, derrick boat hull, U.S. Engineers, Mobile; 80 LBP; 34 beam; 105 DWT; keel Feb 1/24; launch Apr10,24, est; deliver May1,24, est.

Hull 34, sand suction dredge barge, E. T. Slider Co., New Albany, Ind.; 176 LBP; 50 beam; 400 DWT; keel Feb15 24; launch May1,24, est; deliver May10,24, est.

MIDLAND SHIPBUILDING COMPANY, LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Glenifer, hull 12, bulk freighter, Great Lakes Transp. Co.; 560 LOA; 60 beam; 20.6 draft; 3 Scotch boilers, keel June 1 /24, est; deliver spring 1925.

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Leo E. Wege

Hulls 62-64, barges for U.S. govt., 80 LBP, 26 beam; 5 loaded draft; keels Mar20 24, est; deliver May12/24, est.

No name, hull 65, dredge, W. T. Hardison & Co.; 116 LBP; 30 beam; 6 loaded draft; keel July15 24, est; delivery Aug 1 draft.

Hulls 66-71, inc, pontoons, U.S. Engineers, Cincinnati; 40 LOA; 12 beam, 3 loaded draft; keels May/24, est.

Hull 76, deck barge, U.S. govt., Louisville; 200x36x7.5 ft; keel Apr17 24.

Hull 77, sister to above, keel June1 24, est.

Hull 79, deck barge, Greenville Stone & Gravel Co., 120 LBP; 30 beam, 7 loaded draft, keel Apr29 24; deliver June1 24, est.

Hull 80, deck barge, builder's account; 100 LBP; 24 beam, 5 loaded draft; keel June1 24, est.

No name, hull 81, dredge boat hull, T. L. Herbert & Sons; 116 LBP; 30 beam; 6 draft, keel July20 24, est; launch and deliver Sept1 24, est.

NAVY YARD
Boston, Mass

Whitney, destroyer tender No. 4, U.S. Navy; 460 LBP; 61 beam; 21 loaded draft; 16 knots loaded speed; 10,000 tons displ; 7000 SHP; geared Parsons turbines; 2 WT express type boilers; keel Apr23 21, launched Oct12 23; deliver Aug 1 24, est.

NAVY YARD
Philadelphia, Pa.

Dobbin, hull 7, destroyer tender, U.S.N.; 460 LBP; 60.10 beam; 21 loaded draft; 16 loaded speed; 10,000 tons displ; Parsons geared turbine single screw engs, 7000 SHP; 2 WT boilers; keel Dec22 19, launch May5 21, deliver July /24, est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purch. Agent: Jas Plummer, 233 Broadway, N. York City.

George Washington, hull 276, freight and passenger stm., for Dominion Steamship Co.; 375 LBP; 53 beam; 24.9 depth; speed 16 knots; 2100 DWT; Newport News Curtis turbines, 4750 SHP; B&W boilers; keel Mar10,24; launch Sept /24, est; deliver Nov/24, est.

Robert E. Lee, hull 277, sister to above; keel Mar1,24; launch Oct/24, est; deliver Jan/25.

No name, hull 274, combination steamer, Clyde S. S. Co.; 387-6 LBP; 54 beam; 31-6 depth; 1453 loaded speed; 2600 DWT; Newport News Curtis engs; 4200 SHP; 4 Scotch boilers.

No name, hull 275, sister to above.

NEW YORK SHIPBUILDING CORP.
Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Priscilla, hull 265, bulk oil stock; 419-3 LB P; 56-3 beam; 23-9¼ loaded draft; 10¾ loaded speed; 9670 DWT; 3 cyl TE engs, 300 SHP; 3 SE Scotch boilers, 15-10x11-4; keel Feb28/23; launched Mar20,24; delivered Apr. 24.

Hull 290, self-propelled oil barge for Standard Transp. Co.; 260-40x14 feet; 2 350 BHP diesel engs; keel Dec18/23; launched and delivered Apr /24.

Hull 291, sister to above; keel Dec20/23; launched and delivered Apr./24.

Hull 292, sister to above; keel Dec27,23; launch Apr8/24, est.

Hulls 293-4, two carfloats, Harlem Transfer Co., N. Y.; 3 tracks, 27 long; keels spring, deliver summer 1924.

Hulls 295-9, five carfloats, N. Y. Cent. R. R. Co.; 2 tracks, 366 long; keels spring, deliver summer, 1924.

THE PUSEY AND JONES CO.
Wilmington, Del.

No name, hull 1028, steel combination steamer, Norfolk & Washington Stmbt. Co., Washington, D. C.; 297-6 LBP; 51 beam; 23 loaded draft; about 18 mi speed; 1600 DWT; single screw; 4 cyl TE engs, 2400 IHP; 4 Scotch boilers, 12-6; keel May/24, est; deliver Dec31/24, est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Md.

Purchasing Agent: Wm. Wilson.

Tug A, hull 255, U.S. Engineers, Philadelphia, 50 LBP; 14-1½ beam, 5 loaded draft; 41 DW T; 1000 IHP Nelseco engs; launched Jan11,24; delivered Mar15, 24.

Tug B, hull 256, sister to above; launched Jan28,24; delivered April 24.

Tug C, hull 257, sister to above, launched Feb 25 24; delivered May 24.

Tug D, hull 258, sister to above, launched March 24, delivered May21 24.

T. M. Davis, hull 259, boiler tug, A. T. Tay lor & Bros., Norfolk; May 24, est.

Hull 260, steel hull tugboat, Grace Line, Inc, N. Y.; 76-6 LOA, 19 beam; 10 depth, 320 IHP Ingersoll Rand diesel engs; deliver Nov./24, est.

STATEN ISLAND SHIPBUILDING COMPANY
Staten Island, N. Y.

Purchasing Agent: R. C. Miller.

No name, hull 749, steel diesel-electric tugboat, Penn-R. R. Co.; 105 LBP; 24 beam; 13.5 loaded draft.

No name, hull 750, steel diesel-electric tug boat, Atlantic Refining Co.; 94 LBP; 21 beam, 11.5 loaded draft.

No name, hull 751, sister to above.

No name, hull 752, sister to above.

SUN SHIPBUILDING COMPANY
Chester, Pa.

Purchasing Agent: H. W. Scott.

A. Dudley Mansfield, hull 588, hopper dredge, U.S. Engineers; 245 LBP; 46 beam; 19-6 loaded draft.; 100 loaded speed; 2600 DWT; diesel electric drive; keel Mar6 23; launched Nov20 23.

W. L. Saxton, hull 589, sister to above, keel Mar26 23, launched Nov20 23.

Dan C. Kingman, hull 60, sister to above; keel June18 23, launched Mar12,24; deliver June 1,24, est.

Wm. T. Rossell, hull 61, sister to above; keel June21 23; launch May3,24, est; deliver July 1,24, est.

Schetady Swoony, hull 73, motor barge, Standard Transp. Co.; 260 LOA; 46 beam; 14 depth; 2 350 BHP diesel engs; keel Dec5 23; launched Apr5 24; deliver April 24.

Amsterdam, hull 74, sister to above; keel Dec 5 23; launched April 24; delivered Apr25 24.

Rome, hull 75, sister to above, keel Dec5 23, delivered May10 24.

Oswego, hull 76, sister to above; keel Dec 20 23; deliver May15 24, est.

Burlington, hull 77, sister to above; keel Dec 20 23; launch Nov26 24; deliver May22 24, est.

Two carfloats, Baltimore & Ohio R. R.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Greenbrier, hull 21, U.S. Lighthouse tender; 164-6 long by 32-6 by 5-2; 2 non-condensing HP engs, 15-inch diam cylinder, 84-in stroke; 3 Mississippi River type boilers, 26 ft long, coal burning, natural draft; keel June26 23; launched Nov13 23; delivered May15 24, est.

C. E. Harris, hull 31, 24-in pipe line dredge, U.S. Engineers, Cincinnati, O.; 175 long by 50 by 8½; pumping engs, 1000 BHP McIntosh & Seymour diesel; 2 aux 225 BHP McIntosh & Seymour engs; keel Sept20/23; launched Feb21/ 24; deliver July1/24, est.

Tacoma, hull 32, steel hull, Cincinnati Pomeroy & Charleston Packet Co., Cincinnati, O.; 190 long by 37 by 6-2; keel Jan17/24; launch May10/24, est; deliver May17/24, est.

Lookout, hull 33, towboat, U.S. Engineers, Nashville, Tenn.; 116 ft long; 29 ft beam; 5-6 depth; 2 surface condensing tandem comp engs, 300 HP; 1 watertube boiler; coal burning; natural draft; keel Apr17/24; launch June14/24, est; deliver Sept29/24, est.

No name, hull 34, quarter boat, U. S. Engs., Huntington, W. Va.; 106 long; 26 beam.

Repairs

BETHLEHEM SHIPBUILDING CORPORATION, LTD.
UNION PLANT
San Francisco

Drydock, paint, misc.: Oaxaca, Martinez, Argon, W. B. Storey, Contra Costa, Lima, Yenesacha, Asbury Park, Standard Oil Barge No. 93, Manoa, Frank G. Drum, Deroche, Napa Valley, Venetia, Pawler, Wm. Donovan, Hercules, El Segundo, M. S. Piru, Robert Luckenbach, Washington, Service, West Logus, Propeller repairs: Mauna Ala, Mary E. Moore, Enterprise, Manulani. Piping repairs: Sudawscon-cee, Oliva, Betterton, Eagle, Engine, boiler and hull: Manua Ma, Priscilla, Marcos, H. Whittier, Katherine. Boiler: Chas. Christenson. Install oil burning equipments: Korea Maru. Rebrick 9 furnaces: Oreus. 60 special atomizers and tips: President 27, Sierra, Ventura, Hilo, Los Alamos (also hull), Oreus, Covena, Cape Henlopen, La Purisima, Engine, deck and steward's: Finland. Extensive repairs: H. M. Flager. Alterations: Peterson, No. 12. Install fuel oil line: President Van Buren. Misc.: Oleum, President Wilson, Manoa, San Diego, President McKinley, West Calera, Iwatesan Maru, Standard No. 4, Wolfort, F. H. Hallman, Edgar F. Luckenbach, Ventura, Santa Maria, President Pierce, President Monroe, D. G. Scofield, Cirenius, Yale, Hanley, Missourian, Everett, Linden, G. C. Perkins, Hall Brothers, Chaliambra, Atlas, Rose City, San Pedro, Boxen, Geisha, H. W. Baxter, Ohioan, S. C. T. Dodd, Hollywood.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
San Pedro, Calif.

Dock, clean, paint, misc.: yachts Seaward, Ylarka, Adje, Horsetail, Esperanza, Goodwill, stmr H. C. Folger, Wm. G. Warden (extensive damage repairs), Pico, Vaquero, barge Dacula, stmr Tejon, dredge McMullen. Docked for inspection, installed diesel engine, lifeboats, misc. repairs: schr. Speedway. Engine, boiler, hull repairs: El Lobo, Tascaluza, West Montop. Pipe and misc. repairs: Foldstad, Shabonee, Calawah, San Gregorio, Watertown, El Aheto. Paint: launch Argyle. Casiana (misc. repairs). Misc. repairs: India Arrow, Sansome, El Cicuro, yacht Padarius, dredge Lisbeth, stmr. Sumanee, Mckeach, Fred W. Weller, yacht Incas, stmr Yale, Vistula, City of Los Angeles, Baltic, Los Angeles, El Cedro, Eagle, Tuxpanol, dredge Seattle, yacht Frontiersman, m.s. Zoppot.

BREMERTON NAVY YARD
Puget Sound

Misc. repairs and docking: Oklahoma, Gold Star Eagle No. 32, Eagle No. 57, Misc. repairs: Boxer, Reno, William Jones, Eagle No. 11. Misc. repairs incidental to operation as district craft: Malicious, Tattnuck, Swallow, Iroquois, Section nine, Pawtucket.

PRINCE RUPERT DRY DOCK & SHIPYARD
Prince Rupert, B. C.

Extensive bottom damage repairs: stmr. Canadian Scottish. Dock, clean, paint, misc. repairs: tug Lorne; Fairchild, Garfish, general overhauls. Hull repairs: Marmion. Boiler: Derrick scow Lion. Docked for examination: Griff. Docked for new propeller: Newington. Docked and general overhaul to 24 fishing and gas tugs.

TODD DRY DOCKS, INC.
Seattle, Wash.

Convert into ferryboat: Sioux. Dock, clean, paint: tug Milwaukee (also damage repairs), barges 80, 238, Edmond Madison (misc. repairs), Fotheime, Bakersfield, West Henshaw, West Keeler (misc. repairs). Charles H. Cramp, Forest King (misc. repairs), Victoria. Survey and damage repairs: Mauna Loa. Docked for: Edgar Luckenbach, Andrea Luckenbach. Furnish oil burning parts: Argon, Latouche. Renair stern gland: Arator. Stranding damage repairs: Admiral Rodman. General overhaul: C. S. Holmes. Docked for survey: West Cadron. Docked and misc.: West Ison. Misc. repairs: Pawnee, Emma Alexander, Oduna, Tseng Tai, Comanche, Sea Foam, Admiral Evans, Oscus (vent pipes), Loch Tay, Cupram, Wheatland Montana, President McKinley.

PERSONAL PARAGRAPHS AND ITEMS OF INTEREST

TODD Shipyards Corporation announces the appointment of George J. Robinson as president of the Robins Dry Dock & Repair Company, of which he has been vice-president for many years. The Robins Company is one of the subsidiaries of the Todd Shipyards Corporation, of which William H. Todd is president. Mr. Todd was also president of the Robins plant and his retirement recently from that

Geo. J. Robinson, President, Robins Yard

office permitted the advancement of his old friend and associate.

George Dawe and Frank Gilbride, superintendents of the plant, were made vice-presidents, and William J. Robinson, son of the new president, has been appointed superintendent. J. Herbert Todd, son of William H. Todd, has been made president of the Clinton Iron Works, another Todd subsidiary, with Joseph Haag vice-president.

George J. Robinson was born in Brooklyn in 1870 and has been connected with ship construction and repair all his life. He started as a passer-boy with the old firm of Hendren & Robins (now the Robins Dry Dock & Repair Company) and advanced through every post to the presidency.

ATKINS RESIGNS

V. M. Atkins, manager of the North Coast Power Company, has resigned his position as a member of the Port of Kelso Commission, according to a Seattle report.

Prize Contest

The Sperry Gyroscope Company have just announced a Cash Prize Contest for seagoing personnel of the navies and merchant service of the world in order to obtain a title for a picture contained in an advertisement covered elsewhere in this magazine.

The contest opens June 1 and closes August 31. Prizes range from one hundred dollars, first prize, down to five dollars.

The scene for which the title is desired shows the Sperry Gyro-Pilot, familiarly known to seagoing men as "Metal Mike", connected to the steering wheel and automatically steering a vessel at sea; with the deck officer standing at the forward part of the pilot house on lookout, a phantom of the traditional quartermaster is standing at the wheel. A title such as "The Traditional Helmsman Succeeded"; "Today and Yesterday", is desired. The title must not exceed seven words or thirty-five letters. The shorter titles will receive more consideration.

The contest is limited to seagoing personnel (this includes the Great Lakes of North America) of the navies and merchant service of the world and seagoing personnel on land duty.

T. H. Rossbottom, general manager of the United States Lines, New York; J. L. Luckenbach, vice-president of the Luckenbach Steamship Company, New York; and Captain D. S. Miller, marine superintendent of the Cunard Steamship Company, Ltd., New York, will act as judges. The names of the winners will appear, with a reprint of the ad in Pacific Marine Review, with the first prize title used with the picture and also will be announced in detail in the Sperry Gyroscope Company's house magazine, The Sperryscope.

The main office of the Sperry Gyroscope Company is located in Manhattan Bridge Plaza, Brooklyn, New York.

CRAMP'S REPORT

The report of William Cramp & Sons Ship & Engine Building Company for the year ending December 31, 1923, shows net income of $954,003 after interest, taxes and depreciation, equivalent to $6.26 a share earned on $15,232,500 outstanding capital stock. This compares with $2,922,418, or $19.18 a share in 1922.

A. T. L.'s 35th YEAR

This year the Atlantic Transport Line observes the 35th anniversary of its incorporation, 1889 to 1924. It is one of the strongest lines in the Atlantic trade, with an excellent freight service and a unique position in the passenger business, carrying first-class only, between New York and London, in ships of first rank, and enjoying widespread popularity. This spring the Atlantic Transport Line puts into service the second of a new group of passenger liners to replace the famous "Minne" type of vessels it lost during the great war. This is the Minnetonka, of 21,700 tons, which will ply with the Minnewaska, of the same class, completed last year. The two ships will afford fortnightly service. As in most great business successes, one finds back of the achievements of the Atlantic Transport Line the story of a commanding personality—that of Bernard N. Baker of Baltimore, who not only founded the line, but lived to see it attain a high place in the world's shipping that had been the object of his years of endeavor. Mr. Baker passed at Santa Barbara at the age of 64 in 1918.

Bernard N. Baker, founder of Atlantic Transport Line

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INTERCOASTAL-OFFSHORE-COASTWISE
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SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Garfield 4300.
PASSENGERS AND FREIGHT.
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles, and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between San Francisco, Seattle, Vancouver, B. C., Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
201 California street. Phone Douglas 7600.
FREIGHT ONLY.
SAILINGS—North Atlantic - Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles, Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commercial S. S. Lines.)
Swayne & Hoyt, Inc., Pacific Coast agents.
436 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Five steamers between New York, Philadelphia, Wilmington, Norfolk, Baltimore and Los Angeles, San Francisco, Portland and Seattle.

MUNSON-McCORMICK LINE
McCormick Steamship Co., Pacific Coast agts.
215 Market street. Phone Kearny 2500.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

PACIFIC MAIL STEAMSHIP CO.
568 California street. Phone Sutter 3890.
SAILINGS—Intercoastal (Passengers and Freight).
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Manzanillo, Los Angeles, San Francisco.
SAILINGS—Intercoastal (Direct Freight Service).
Every 7 days. Eastward calls: San Francisco, Los Angeles, Philadelphia, New York and Norfolk. Westward calls: New York, Baltimore, Norfolk, Los Angeles, San Francisco.

PACIFIC-CARRIBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Offices: 550 Market street. Phone Douglas 8680.
Freight and Operating Offices: Pacific Steamship Co., 60 California St. Phone Sutter 7800.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
W. D. Benson, Pac. Coast Mgr.,
311 California street. Phone Garfield 6760.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles and San Francisco

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, Pacific Coast Agents.
230 California street. Phone Garfield 2846.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
A. F. Zipf, Pacific Coast manager.
110 California street. Phone Douglas 1670.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 16 days between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, and New York, Philadelphia, Norfolk and Baltimore.

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Dearborn, agent.
Mutual Life Building.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia, Norfolk and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Every 10 days between Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, agent.
[illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Seattle, Los Angeles, San Francisco, Vancouver, New York, Boston,

COAST INSPECTION

Thomas Kitching, senior English member of the firm of Simpson, Spence & Young, one of the largest chartering brokerage houses in the world, and C. A. Waters, of the New York office, are making a tour of Pacific Coast ports. H. S. Scott, president of the General Steamship Corporation, is accompanying the visitors on the survey trip. Simpson, Spence & Young are eastern and English representatives of the General Steamship Corporation, while the General handles the Simpson, Spence & Young affairs on the Pacific Coast.

SINKS AT DOCK

The ex-army transport Warren, which was sold to Chinese interests some time ago and which has been operating on the China coast, turned turtle and sank at her dock in Shanghai, according to a recent dispatch. She was undergoing repairs at the time. The old timer was 2510 tons net and was built in 1889. She was 370.7 feet long, 43.3 beam, and 26.5 depth.

TITUS PROMOTED

Norman F. Titus, general claim agent of the McCormick Steamship Company, has been promoted to the position of assistant general manager, effective immediately, it is announced by Charles L. Wheeler, vice-president and general manager. In addition to the duties of a general nature which Mr. Titus' new post covers, he will also have direct charge of the claims and insurance departments of the organization. Mr. Titus recently spent several months in New York in interest of McCormick affairs. He is one of the ablest of the shipping executives on the Coast. Mr. Titus has held several important positions in the marine industry and his latest advancement is received with interest by his host of friends in every branch of the game.

INTERCOASTAL

Baltimore, Philadelphia, Norfolk and Portland, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
L. C. Smith Building. Phone Elliott 1206.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland, Los Angeles, Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commercial S. S. Lines.)
Swayne & Hoyt, Inc., agents.
Lobby 4 Central. Phone Elliott 6383.
FREIGHT ONLY.
SAILINGS—Intercoastal.
By 5 steamers between New York, Philadelphia, Wilmington, Norfolk, Baltimore, and Los Angeles, San Francisco, Portland and Seattle.

MUNSON-McCORMICK LINE
Pier 6. Phone Elliott 5367.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco, Portland, Tacoma and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt.
Lobby 4 Central. Phone Elliott 6383.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Office, 619 Second avenue.
Pacific Steamship Company, agents.
L. C. Smith Building. Phone Elliott 2068.
SAILINGS—Intercoastal.
Regular intervals between New York, San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
Transmarine Corporation.
4421 White Building. Phone Elliott 6127.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles and San Francisco.

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, agents.
Arctic Club Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
Spokane street terminal. Phone Elliott 6657.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, and New York, Philadelphia, Norfolk and Baltimore.

LOS ANGELES

AMERICAN-HAWAIIAN S. S. CO.
W. S. McPherson, agent.
Central Building. Phone 821-336.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Van Nuys Building. Phone Maine 873044.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks from Vancouver, Seattle, Portland, San Francisco and Los Angeles to New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
212 Mortgage Guarantee Bldg., 626 So. Spring St. Phone 874-891
PASSENGERS AND FREIGHT
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Sailings between Los Angeles, San Francisco, Seattle, Vancouver, B. C., New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Building. Phone 873044.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company.
208 West Eighth street. Phone Main 808.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 14 days from Vancouver, Seattle, Portland, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commercial S. S. Lines.)
Swayne & Hoyt, Inc., agents.
488 Pacific Electric Bldg. Phone 824-659.
FREIGHT ONLY.
SAILINGS—Intercoastal.
by five steamers between New York, Philadelphia, Wilmington, Baltimore, Norfolk and Los Angeles, San Francisco, Portland and Seattle.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
Lane Mortgage Bldg. Phone Metropolitan 6140
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

PACIFIC MAIL STEAMSHIP CO.
Passenger Offices: 503 South Spring street.
Freight Offices: 108 West Sixth street.
SAILINGS—Intercoastal (PASSENGERS AND FREIGHT).
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Baltimore, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Los Angeles and San Francisco.
SAILINGS—Intercoastal (DIRECT FREIGHT SERVICE).
Every 7 days. Eastward calls: San Francisco, Los Angeles, Baltimore, New York and Norfolk. Westbound sails: New York, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
488 Pacific Electric Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA-PACIFIC LINE
International Mercantile Marine Company.
Freight Offices: Pacific Steamship Company, 322 Citizens National Bank.
Passenger Offices: 510 So. Spring st. Phone 822-511.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
(Transmarine Corporation.)
G. T. Hanson, agent.
A. G. Bartlett Bldg. Phone 821-47
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles and San Francisco.

UNITED AMERICAN LINES, INC.
Los Angeles Steamship Company, agents.
407 Central Building.
FREIGHT ONLY.

CALIFORNIA TRAVEL

R. F. Cullen, general passenger agent of the Los Angeles Steamship Company, operating the liners Yale and Harvard in the California coastal route, states that advance reservations by eastern tourist agents and steamship representatives indicate that the 1924 summer travel will see new records in the number of passengers handled. Mr. Cullen attributes the increasing California tourist business to publicity and instructive promotion.

RESUMING SERVICE

John W. Chapman, general manager of the New Electra Line, with headquarters at 318 Market street, San Francisco, announces resumption of passenger and freight service between San Francisco and Portland with the popular electric-drive liner Cuba. The Cuba began service for the new season, sailing May 20 from San Francisco. The schedule calls for departures from San Francisco every Thursday afternoon, arriving at Portland Thursday evening, and southbound from Portland Saturday afternoons, reaching San Francisco at 8 o'clock Monday mornings. The Cuba has been thoroughly reconditioned at the General Engineering & Dry Dock Company plant, Alameda. Mr. Chapman reports heavy passenger and freight inquiries.

OLD TIMER PASSES

Captain R. D. Reed, veteran Pacific mariner, died May 13 at his home in Oakland following an illness of several weeks. Until two years ago Captain Reed was active in shipping, having served for six years as port superintendent for the Pacific Mail Steamship Company at Yokohama. Before joining the Pacific Mail line Captain Reed served with the Pacific Improvement Company. Surviving are his widow and two children.

KETCHIKAN CABLE

Seattle and Ketchikan, Alaska, will be in communication over a new cable within a month if the laying of the line is completed on scheduled time by the United States Army cableship Dellwood, according to an announcement by Colonel George S. Gibbs, officer in charge. The Dellwood arrived at Seattle on May 8 from London with 955 miles of submarine cable, weighing 3522 tons and costing more than $750,000. When the Seattle-Ketchikan line is complete the Dellwood will return to London for a second cargo of cable which will connect Ketchikan with Seward.

UNITED AMERICAN LINES, INC.

PACIFIC COAST HEADQUARTERS, 230 CALIFORNIA STREET, SAN FRANCISCO

S. S. Mount Clinton—One of the Express Intercoastal Freighters

INTERCOASTAL
WEEKLY SERVICE
VIA PANAMA CANAL
Baltimore-New York
Savannah and Los Angeles
San Francisco-Seattle-Portland

NORTH PACIFIC-EUROPEAN
FORTNIGHTLY SERVICE
PASSENGERS and FREIGHT
Between North Pacific Ports
and
United Kingdom-Continent

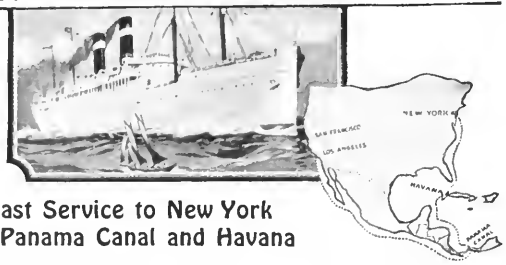
PACIFIC COAST AGENTS

LOS ANGELES S. S. COMPANY, Los Angeles
SUDDEN & CHRISTENSON, San Francisco and Puget Sound
COLUMBIA PACIFIC SHIPPING CO., Portland

ATLANTIC COAST AGENTS

UNITED AMERICAN LINES, INC.

THE NEW WAY EAST



Fast Service to New York
via Panama Canal and Havana

Regular Dependable Coast to Coast Passenger and Freight Service
New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle, Tacoma

WESTBOUND From New York, Pier 61, N. River		EASTBOUND From San Francisco, Pier 22—Los Angeles Har	
MANCHURIA	June 5	FINLAND	June 7 — June 9
KROONLAND	June 19	MANCHURIA	June 28 — June 30
FINLAND	July 3	KROONLAND	July 12 — July 14
MANCHURIA	July 31	FINLAND	July 26 — July 28
KROONLAND	Aug. 14	MANCHURIA	Aug. 23 — Aug. 25
FINLAND	Aug. 28	KROONLAND	Sept. 6 — Sept. 8

Direct connections at New York and thru Bills of lading issued via: American Line to HAMBURG, Red Star Line to ANTWERP, Atlantic Transport Line to LONDON, White Star Line to LIVERPOOL, SOUTHAMPTON and MANCHESTER

PANAMA PACIFIC LINE

INTERNATIONAL MERCANTILE MARINE COMPANY

Passenger Offices:
T. H. LARKE—Pacific Coast Manager

SEATTLE, 619 Second Ave.
SAN FRANCISCO, 550 Market St.
LOS ANGELES, 510 South Spring St.

PACIFIC STEAMSHIP CO. (The Admiral Line), General Freight Agents Pacific Coast

SAN FRANCISCO, 60 California St.
LOS ANGELES, 322 Citizens National Bank
SEATTLE, L. C. Smith Bldg.
PORTLAND, Admiral Line Terminal

INTERCOASTAL

SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company.
Stock Exchange Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 16 days between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, and New York, Philadelphia, Norfolk and Baltimore.

PORTLAND

AMERICAN-HAWAIIAN S. S. CO.
C. D. Kennedy, agent.
Railway Exchange Building.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
400 Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Portland, York, Boston, Providence, Philadelphia and Baltimore.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
Spalding Building. Phone Broadway 4378.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 14 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MOORE & McCORMACK CO., INC.
(Managing agents for Commercial S. S. Lines.)
Swayne & Hoyt, Inc., agents
1008 Spalding Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
By five steamers between New York, Philadelphia, Wilmington, Baltimore, Norfolk and Los Angeles, San Francisco, Portland and Seattle.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
181 Burnside street. Phone Broadway 1498.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland and Seattle.

PACIFIC MAIL STEAMSHIP CO.
Norton, Lilly & Co., agents
Yeon Building
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days. Eastward calls: San Francisco, Los Angeles, Baltimore, New York and Norfolk. Westbound calls: New York, Baltimore, Norfolk, Los Angeles, San Francisco.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc. agents
1008 Spalding Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Pacific Steamship Company, freight agents.
Admiral Line Terminal.
SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

UNITED AMERICAN LINES, INC.
Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

VANCOUVER

ARGONAUT STEAMSHIP LINE
B. W. Greer & Son, Ltd.
602 Hastings street, West.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Every 30 days, Vancouver to Montreal. Through bills of lading from other Pacific Coast ports.

DOLLAR STEAMSHIP LINE
Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Vancouver, B. C., Seattle, San Francisco, Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

ISTHMIAN STEAMSHIP LINES
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Empire Shipping Company, Ltd.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Galveston New Orleans, and Mobile.

MOORE & McCORMACK CO., INC.
Canadian American Shipping Company, Ltd.
Phone Seymour 2198.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 3 weeks from North Pacific Coast ports, San Francisco, Los Angeles, to New York, Philadelphia, Wilmington, Baltimore and Norfolk.

MUNSON-McCORMICK LINE
Kingsley Navigation Company, Ltd.
402 Pender street, West. Phone Seymour 9506.
FREIGHT ONLY
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco and North Pacific Coast ports.

PACIFIC-CARIBBEAN GULF LINE
Kingsley Coast Agency
413 Pacific Building
FREIGHT ONLY.
SAILINGS—Monthly from North Pacific ports San Francisco, Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports.

ORIENTAL

SAN FRANCISCO

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
Dodwell & Company.
2 Pine street. Phone Sutter [illegible]
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.
SAILINGS—India Service.

HOME AGAIN

Captain Robert Dollar is home again in San Francisco after a six-months' tour of the globe in connection with the Dollar Steamship Line's round-the-world passenger and freight servce.

WAESCHE GOES EAST

Lieutenant Commander R. R. Waesche, for three years commander of the Coast Guard cutter Snohomish, has left Seattle for Philadelphia, where he takes command of the U. S. destroyer Beale, which is to join the fleet of "rum hound exterminators." Lt. Waesche has had a highly commendable record in North Pacific service, having taken part in a number of maritime rescues. The government is preparing 20 destroyers for service in the Atlantic Coast rum-chase. The Beale is reconditioning at the Philadelphia Navy Yard. The government is spending two millions in this offensive against the liquor league.

STEELE TO JAPAN

James King Steele, director of promotion for the T. K. K. and editor of "Japan," is en route to Japan on the Korea Maru. He is to make a survey of trade prospects in the reconstructed area and will bring home some highly interesting material for editorial and publicity purposes.

COAST LUMBER

A. F. Zipf, Pacific Coast manager of the Williams Line, is back in San Francisco after a tour of North Pacific ports and reports improved conditions. "The outlook is very good, but not startling," said Mr. Zipf; "lumber offerings are liberal and are holding firm at $14.50 and $15 per thousand feet in the intercoastal trade. The volume that is moving is satisfactory, and appearances are that such will continue. The next four Williams Line freighters to sail eastbound are booked full with lumber and will carry approximately four million feet each. The last two vessels departing for the Atlantic ports carried about nine million feet between them."

U. A. L. PUBLICITY

Emil Lederer, vice-president of the United American Lines, 35-39 Broadway, New York, announces the appointment of Louis Weickum to the position of advertising and publicity manager, effective May 1.

COLUMBIA-PACIFIC

The Columbia-Pacific Shipping Company, with head offices in Portland, Oregon, at its recent annual meeting, re-elected all officers and

ORIENTAL

Once every 4 or 5 months from Vancouver to usual ports, Bombay and Calcutta.

DOLLAR STEAMSHIP LINE

The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Garfield 4300.
PASSENGERS AND FREIGHT
SAILINGSTrans-Pacific.
Fortnightly from San Francisco to Honolulu, Kobe, Shanghai, Hongkong, Manila and Singapore.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings between San Francisco, Seattle, Vancouver, Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles.

GARLAND STEAMSHIP CORP.

FREIGHT ONLY.
244 California street. Garfield 4700.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from San Francisco and Portland direct to Shanghai and Manila.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
Merchants Exchange Bldg. Phone Sutter 3414.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NIPPON YUSEN KAISHA

Dodwell & Company, Ltd.
2 Pine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Regular service between China, Japan ports and United States Atlantic ports via Panama Canal, vessels calling at San Francisco on both outward and homeward voyages. One arrival monthly from Japan, discharging cargo at San Francisco. One to two sailings monthly homeward, occasionally loading cargo for Yokohama, Kobe and Shanghai.

OSAKA SHOSEN KAISHA

McCormick, McPherson & Lapham.
503 Market street. Phone Kearny 3632.
SAILINGS—San Francisco Service (FREIGHT ONLY).
Monthly service to and from Yokohama, Kobe, Moji, Shanghai, Hongkong and Singapore.
SAILINGS—Los Angeles Service (PASSENGERS AND FREIGHT).
A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, the Panama Canal and Los Angeles.

PACIFIC MAIL STEAMSHIP CO.

508 California street. Phone Sutter 3800.
(Operating U. S. S. B. vessels)
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific Service.
Every 14 days from San Francisco to Honolulu, Yokohama, Kobe, Shanghai, Manila and Hongkong.
SAILINGS—Hongkong-India (Freight Only.)
Connection at Hongkong every 2 weeks for India ports.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels)
112 Market street. Phone Sutter 7640.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular intervals from Los Angeles, San San Francisco, thence direct to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Darien, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
549-51 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific.
Twice a month every second Thursday, between San Francisco, Honolulu, Yokohama, Kobe, Nagasaki, Shanghai and Hongkong.
SAILINGS—Monthly to China and Japan on steamers from the West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
223 Robert Dollar Bldg. Phone Garfield 3899.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

SEATTLE

ADMIRAL ORIENTAL LINE

L. C. Smith Building. Phone Elliott 2068.
SAILINGS—PASSENGERS AND FREIGHT.
Every 12 days between Seattle, Victoria, B. C., Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—FREIGHT ONLY.
Regular service to Vladivostok, Dairen, Tientsin, Tabu Bar, Tsingtao, Shanghai and Japan ports on either outward or homeward voyages, as freight offers justify direct call.
SAILINGS—Monthly service to Yokohama, Kobe, Shanghai, Foochow, Amoy, Swatow, Manila, Cebu and Iloilo.

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Stuart Building. Phone Elliott 0147.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

DOLLAR STEAMSHIP LINE

Admiral Oriental Line, agents.
L. C. Smith Building. Phone Elliott 0794.
PASSENGERS AND FREIGHT
SAILINGS—Fortnightly from Los Angeles to San Francisco, Honolulu, Kobe, Shanghai, Hongkong, Manila and Singapore.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular sailings North Pacific Coast ports to Shanghai, Kobe, Hongkong and Manila, returning via Los Angeles and San Francisco.

R. T. JOHNS & COMPANY

R. T. Johns & Company, agents.
Central Building. Phone Elliott 7697.
FREIGHT ONLY.
SAILINGS—Tramp service between Seattle and Oriental ports of Yokohama, Kobe, Nagoya, Shimidzu and Moji.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
American Bank Building. Phone Elliott 1450.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco, Portland, Seattle and Puget Sound ports, thence to China and Japan.

NIPPON YUSEN KAISHA

Colman Building. Phone Elliott 3514.
PASSENGER AND FREIGHT.
SAILINGS—Frequent intervals, calling at Victoria or Vancouver, B. C., Yokomama, Kobe, Nagasaki, Shanghai, Hongkong or other Oriental ports as inducements offer.

OSAKA SHOSEN KAISHA

W. C. Dawson & Company, agents.
Mutual Life Building. Phone Elliott 0842.
PASSENGERS AND FREIGHT.
SAILINGS—Regular fortnightly service to Yokohama, Kobe, Moji, Dairen, Shanghai, Manila and Hongkong.

SUZUKI & COMPANY

Colman Building. Phone Elliott 2535.
FREIGHT ONLY.
SAILINGS—Irregular service between Seattle and Japanese ports.

THORNDYKE-TRENHOLME CO.

L. C. Smith Building. Phone Main 3168.
FREIGHT ONLY
SAILINGS—Regular service between Puget Sound, Grays Harbor, Vancouver and Yokohama, Kobe, Osaka and Nagoya.

WALKER-ROSS, INC.

L. C. Smith Building. Phone Elliott 1174.
FREIGHT ONLY
SAILINGS Regular service between Seattle and Yokohama, Kobe, Osaka and Nagoya

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
Central Building.
FREIGHT ONLY.
SAILINGS Every 2 weeks from Seattle to Yokohama, Kobe, Osaka and Nagoya.

LOS ANGELES

CANADIAN GOVERNMENT MERCHANT MARINE

Dodwell & Company.
412 Union Bldg. Phone Broadway 7[illegible]
[illegible] Avenue 4[illegible]
FREIGHT ONLY
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.
SAILINGS India Service.
Once every 4 or 5 months from Vancouver to usual ports, Bombay and Calcutta.

directors for the ensuing year and declared an annual dividend of ten per cent.

The officers are: J. C. Ainsworth, president; K. D. Dawson, vice-president and general manager, and S. P. Fleming, secretary and treasurer. The directors are: J. C. Ainsworth, K. D. Dawson, Erskine Wood, H. B. Van Duzer and Drake C. O'Reilly.

The Columbia-Pacific Shipping Company began operation in the Trans-Pacific trade, April, 1920, starting with two ships. At the end of 1923 seventeen ships were in service. This fleet has recently been reduced to ten.

FRASER AT PORTLAND

D. J. Fraser, recently named Portland manager for Furness (Pacific), Ltd., has opened offices in the Spalding. Harold Bettendorf, formerly with Statter & Johnstone, Portland steamship agents, has joined the Furness staff as assistant to Mr. Fraser, who came to Portland from Seattle, where he was steamship manager for Balfour, Guthrie & Company.

REORGANIZATION

Following the death of George A. Moore several months ago, the firm of George A. Moore & Company, ship operators and commission merchants of San Francisco, has been reorganized under the name of DuVal Moore & Company. Fred Juell has been made a partner in the new firm. DuVal Moore is the son of the founder.

DENNISTON DIES

A. B. C. Denniston, formerly of Seattle and widely known in rail and steamship circles, passed away recently in Honolulu. Mr. Denniston was traffic manager at Honolulu for Fred Waldron & Company. He came to the Pacific Coast from Michigan in 1895. He was general agent for the Great Northern Railway at Portland from 1895 to 1905, before going to Seattle.

NICARAGUAN CONSUL

Collector of Customs W. B. Hamilton at San Francisco announces an advice from Washington of the recognition of Juan Jose Ruiz as general consul of Nicaragua at San Francisco for the states of California, Oregon and Washington.

PACIFIC MAIL BUILDING

Contracts for outfitting the new Pacific Mail motorships, City of San Francisco and City of Panama, with telephone and wireless sets have

ORIENTAL

DOLLAR STEAMSHIP LINE
212 Mortgage Guarantee Bldg. Phone 874-891.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings between Los Angeles, San Francisco, Seattle, Vancouver, Yokohama, Kobe, Shanghai, Hongkong, and Manila.

OSAKA SHOSEN KAISHA
McCormick, McPherson & Lapham.
Central Building.
PASSENGERS AND FREIGHT.
SAILINGS—A steamer a month to Yobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, Panama Canal and Los Angeles.

STRUTHERS & BARRY
(Operating U. S. S. B. vessels.)
701-702 Transportation Building.
Phone Tucker 5969.
FREIGHT ONLY.
SAILINGS—Regular intervals from Los Angeles and San Francisco, thence to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Dairen, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA
(Oriental Steamship Company.)
S. L. Kreiker, agent.
375 Pacific Electric Bldg. Phone TRinity 6556.
PASSENGERS AND FREIGHT.
SAILINGS—Every second Thursday to China and Japan via San Francisco on steamers of Japan, Hongkong, San Francisco line.
SAILINGS—Monthly to Oriental ports via San Francisco on steamers from West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

PORTLAND

GARLAND STEAMSHIP CORP.
General Steamship Corp., agents.
212 Porter Bldg. Phone Broadway 6714.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from San Francisco and Portland direct to Shanghai and Manila.

MITSUI & COMPANY, LTD.
(Mitsui Bussan Kaisha, Ltd.)
702 Wilcox Building. Phone Main 4113.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NORTH CHINA LINE
(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Taku Bar and Dairen.

TOYO KISEN KAISHA
(Oriental Steamship Company.)
Oregon-Pacific Company, agents
203-4 Wilcox Building. Phone Bdwy. 4529.
FREIGHT ONLY.
SAILINGS—Monthly from Portland to Oriental ports.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

SOUTH CHINA LINE
(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Broadway 5360.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Portland to Yokohama, Kobe, Hongkong and Manila.

YAMASHITA KISEN KOGYO KAISHA
Yamashita Company.
1109 Porter Building.
FREIGHT ONLY.

SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., agents.
Yorkshire Building. Phone Seymour 9576.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.
SAILINGS—India Service.
Once every 4 or 5 months from Vancouver to usual ports, Bombay and Calcutta.

CANADIAN PACIFIC STEAMSHIPS, LTD.
Canadian Pacific Railway Station. Phone Seymour 2630.
PASSENGERS AND FREIGHT.
SAILINGS—Every 14 days from Vancouver to Japanese ports, Shanghai and Hongkong. Every 28 days to Manila.

DOLLAR STEAMSHIP LINE
Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings from North Pacific ports to Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles and San Francisco.

FURNESS PRINCE LINE
Furness Withy & Company, Ltd.
Furness (Pacific), Ltd.
1313 Standard Bank Building.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Vancouver to Yokohama, Kobe, Shanghai and Hongkong.

NIPPON YUSEN KAISHA
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Vancouver and ports in Japan, China and Philippines.

OSAKA SHOSEN KAISHA
Empire Shipping Company, Ltd.
815 Hastings St., W. Phone Seymour 8014
8014.
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks to all ports in Japan and China, also Vladivostok, Singapore, Bombay, etc.

SUZUKI & COMPANY
B. L. Johnson Walton & Company.
850 Hastings street, West. Phone Seymour 7147
FREIGHT ONLY.
SAILINGS—Irregular service between Pacific Coast ports and Japan ports.

WALKER-ROSS, INC.
Canadian American Shipping Company, Ltd.
Phone Seymour 2198.
FREIGHT ONLY.
SAILINGS—Regular service to Yokohama, Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO KAISHA
Sanderson, Kenahan, Ltd.
FREIGHT ONLY.
SAILINGS—Every 2 weeks to Yokohama, Kobe, Osaka and Nagoya.

UNITED KINGDOM---CONTINENTAL EUROPE

SAN FRANCISCO

BLUE FUNNEL LINE
Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd
2 Pine street. Phone Sutter 4201.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.
The East Asiatic Company, Inc., agents.
433 California street. Phone Sutter 6717.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific [illegible] ports, direct to Hamburg, Hull, Copenhagen, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE, LTD.
Norton, Lilly & Company, general agents.
485 California street. Phone Sutter 3600.
FREIGHT ONLY.

been awarded the Radio Corporation of America. The City of San Francisco was recently launched at Gothenburg and the City of Panama will take the water soon. They will operate in the Pacific Mail's San Francisco-Panama passenger and freight service.

COLE GOES UP

T. M. Cole, since March 16, 1921, chief clerk in the general passenger office of the Los Angeles Steamship Company at San Francisco, has been appointed assistant general passenger agent, effective May 1, it is announced by Roy V. Crowder, passenger traffic manager of the line. Mr. Cole has had twenty years in the passenger traffic field. In July, 1918, he went with the Pacific Mail, in charge of passenger accounts, and from that firm joined the Los Angeles Steamship Company.

WHEELER RETURNS

Charles L. Wheeler, vice-president and general manager of the McCormick Steamship Company, has returned to the head office at San Francisco after a two weeks' business trip to Seattle, Portland and other northern shipping points.

KNIGHT & WILSON

Knight & Wilson, yacht and insurance brokers of San Francisco, have been appointed exclusive Pacific Coast agents for the Rochester Boat Works, Inc., of Rochester, N. Y. They will handle the entire line of Rochester standardized cruisers, constructed in sizes from thirty-three to sixty-two feet. Knight & Wilson are widely known among the yachting fraternity of San Francisco bay.

GOOD WORK!

J. R. Fitzgerald, agent of the American-Hawaiian Steamship Company, has started a new scheme of service to shippers. In effect, Mr. Fitzgerald's idea is to acquaint shippers with the individuals of the American-Hawaiian staff handling the specific work in which the shippers are intersted. It is a "personal service" move and it is certain to re-act in good will for the organization.

SHORESIDE

Al Evans, probably one of the best known chief stewards in the Pacific passenger trades, has closed his career at sea, accepting the chief stewardship of the Affiliated Colleges at San Francisco. Evans followed the blue for forty years. For the past eighteen years he has been with the Toyo Kisen Kaisha.

UNITED KINGDOM---CONTINENTAL EUROPE

SAILINGS—Service between Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation, sub-agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
710 Balfour Building. Phone Sutter 6478-6479.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports when inducements offer.

GENERAL STEAMSHIP CORP.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
351 California street. Phone Sutter 6437.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
E. C. Evans & Sons, agents.
260 California street. Phone Douglas 8040-1-2.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
W. R. Grace & Co., general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Royal Mail Steam Packet Company and Holland America Line.)
401 Market street. Phone Douglas 7510.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

NORWAY PACIFIC LINE
485 California street. Phone Sutter 5099.
FREIGHT ONLY.
SAILINGS—From San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia. Sailings every 30 days.

PACIFIC EUROPEAN LINE
Parke Ashburn & Co., Pac. Coast agents.
110 California street. Phone Douglas 1670.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco and United Kingdom and Continental Europe.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
488 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.
Sudden & Christenson, Pacific Coast Agents.
230 California street. Phone Garfield 2846.
For passengers, Phone Sutter 46.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SEATTLE

BLUE FUNNEL LINE
Dodwell & Company, Ltd., agents.
Stuart Building. Phone Elliott 0147.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.
The East Asiatic Company, Inc., agents.
823 Alaska Building. Phone Elliott 2545.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports direct to Hamburg, Hull, Gothenberg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Service between Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation.
Colman Building. Phone Elliott 5706.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness, Withy & Company Ltd.)
Furness (Pacific), Ltd.
705 Arctic Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
Colman Building. Phone Elliott 5706.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company, agents.
Stuart Building. Phone Elliott 1464.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings every 2 weeks.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
W. R. Grace & Company.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint Service of the Royal Mail Steam Packet Company and Holland America Line.)
204-206 Rainier Building. Phone Elliott 4944.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

PACIFIC EUROPEAN LINE
Peter S. Large Shipping Co., agents.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco and United Kingdom and Continental Europe.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.
Sudden & Christenson, agents.
Arctic Club Building.
PASSENGERS AND FREIGHT.
SAILINGS—North-Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

BUFORD STARS

The Alaska Siberian Navigation Company liner Buford is in Southern California waters making movies. Captain John O'Brien, master, is in command. The Buford recently completed what is said to be the most fascinating cruise of the South Seas ever made.

AUDITOR DEAD

W. E. Stuhr, auditor for the Pacific Steamship Company, with headquarters in Seattle, passed away recently at his home. Mr. Stuhr was with the company for many years and before joining that flag served with the Alaska Pacific Company and the Pacific Coast Steamship Company. He was in failing health for several months.

N. Y. SHOW ROOM

The Kuhlman Electric Company of Bay City, Michigan, manufacturers of power, power distributing, and street lighting transformers, have opened a sales office at 300 Madison avenue, New York, in charge of D. F. Potter, Jr. Mr. Potter is a graduate electrical engineer, Cornell, 1916. After completing the General Electric test course at the Lynn, Pittsfield, and Schenectady plants Potter entered the employ of the Robertson-Cataract Electric Company, Buffalo, as sales manager. He has been with the Kuhlman firm one year.

MORE CAPPY RICKS

Peter B. Kyne, writer of some mighty interesting sea tales, is en route to the Orient to gather first-hand material for a series of stories entitled "Cappy Ricks' Impressions of World Wide Conditions." The novelist is sailing on the Dollar round-the-world liner President Van Buren, last of the seven ships of the "522"-type recently purchased by Captain Robert Dollar for his globe-girdling passenger and express freight service. Captain Dollar, pioneer in Pacific trades, has furnished much copy for the Peter B. Kyne narratives.

EAST ASIATIC

The Danish East Asiatic Company of Copenhagen, engaged in mercantile and shipping business, reports that its 1923 transactions resulted in a net profit of 18,500,000 kroner, out of which a dividend of 14 per cent will be paid to shareholders. A year ago 12 per cent was distributed, and 20 per cent in 1921. The shipping branch showed a net of 7,000,000 kroner. Owing to high prices of construction materials, no large program will be undertaken,

HAWAII

The Surf-Riders' Paradise!

"Maybe you've gone tobogganing—and ice-boating—and airplaning. But if you've never tried surf-riding . . you don't know what it's like to stand on a comet in a splinter of blue and gold and diamond, and be a fish and a bird and a sun-tanned god all at once!

"Of course you can surf-ride without going to the home of it," says this writer in *Vogue*. "But it isn't quite the same away from those magic seas around Honolulu. They never get colder than 70 —you can stay in all day. If you can't ride your comet unaided, there are outrigger canoes that are almost as good. . .

"Over on the Big Island, that weird old devil of a volcano (Kilauea), spitting its venom at the stars forever and ever—white hot, sunset-colored, enormous, sinister beyond words. Mauna Kea (White Mountain) with the snows on its head. Tree-fern forests. A spectacular railroad with hairpin curves two hundred feet above the bluest ocean, on the edge of cliffs that go straight down. . ."

See it all *this* summer! Let us tell you about our 21-day inclusive (all-expense) tours, by which you can see Hawaii for from $276.50 to $386, with two weeks on shipboard and one in the Islands.

MATSON

Navigation Company

225 Market Street, San Francisco

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Send me your booklets "Delightful Days on Matson Ships", and "See All of Hawaii", describing Matson voyages and inclusive (all-expense) tours in the Islands.

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Address .....

$1200 ***First Class*** **$1200**

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SAN FRANCISCO (or LOS ANGELES, PORTLAND OR SEATTLE), HONOLULU, SAMOA, SYDNEY, AUSTRALIA, JAVA, SINGAPORE, PENANG, COLOMBO, SUEZ, PT. SAID, ALEXANDRIA, NAPLES, GENOA, MARSEILLES, (LONDON $35.00 Extra Rail), NEW YORK and Choice of Railways Across U. S. Stop-overs.

Oceanic S. S. Co.'s sailings: Ventura, April 8, Sonoma, May 6; Ventura June 10, July 8, August 12, etc. Transhipping at Sydney to favorite Java lines to Singapore; from Singapore splendid Government built steamers of Dollar Line to Marseilles or New York. $140 extra via Panama Canal.

Standard Service Throughout

Honolulu, $220 Round Trip, First Class
Sydney and Return, $565

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OCEANIC STEAMSHIP CO.

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Canadian-Australasian Royal Mail Line

TO

Honolulu, T. H. Suva, Fiji
New Zealand Australia

The Large and Modern Steamers

R. M. S. NIAGARA 20,000 Tons Dis.

R. M. S. MAKURA 13,500 Tons Dis.

Sail from VANCOUVER, B. C., every 28 days

Cargo Service

Monthly sailings from Vancouver to main New Zealand ports, also to Sydney, Melbourne and Adelaide, Australia, are maintained by the following up-to-date cargo steamers:

M. S. HAURAKI S. S. WAIOTAPU

S. S. WAIRUNA

S. S. WAIKAWA S. S. WAIHEMO

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CANADIAN PACIFIC RAILWAY CO. and all RAILWAY AND STEAMSHIP AGENTS

OR TO

CANADIAN - AUSTRALASIAN ROYAL MAIL LINE

741 Hastings St., West VANCOUVER, B. C.

UNITED KINGDOM---CONTINENTAL EUROPE

LOS ANGELES

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company.)
Dodwell & Company, Ltd.
412 Union Oil Building. Phone Broadway 7900 and Vanduke 4944.
FREIGHT ONLY.
SAILINGS—Every 6 weeks from North Pacific Coast ports, including Sao Francisco and Los Angeles to London, Liverpool and Glasgow via Panama Canal.

EAST ASIATIC COMPANY, LTD.
Balfour, Guthrie & Company, agents.
315 Union Oil Bldg. Phone 827-134.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Van Nuys Building. Phone 873044.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
S. L. Kreider, agent.
375 Pacific Electric Bldg. Phone TRinity 6556.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness Withy & Company, Ltd.)
Swayne & Hoyt, Inc., agent.
488 Pacific Electric Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco, Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
S. L. Kreider, agent.
Pacific Electric Bldg. Phone Pico 6689 Bdy. 23.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
315 Union Oil Building. Phone 7865.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Building. Phone 873044.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
H. R. & M. F. McLaurin, Inc.
406 South Main street. Phone Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Holland-America Line and Royal Mail Steam Packet Co.)
C. J. Lehman, agent.
123 E. Sixth street. Phone Trinity 5171.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Seattle, Portland, Astoria, San Francisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

NORWAY PACIFIC LINE
703 Palos Verdes street, San Pedro.
FREIGHT ONLY.
SAILINGS—Four motorships operating from San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia. Sailings every 30 days.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
Van Nuys Building. Phone 873044.
FREIGHT ONLY.
SAILINGS—Service from Vancouver, Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.
Los Angeles S. S. Company, agents.
407 Central Building.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

PORTLAND

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.)
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles and London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.
Chalmers & Cartwright, Inc., agents.
Porter Building. Phone Broadway 415.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
(General Steamship Corporation.)
Porter Building. Phone 6714.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
708 Spalding Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
Porter Building. Phone Broadway 672.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
355 Oak street. Phone Bdwy. 361.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
Ladd & Clarke, agents.
305 Third street.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Holland-America Line and Royal Mail Steam Packet Co.)
Oregon-Pacific Company, agent.
703 Wilcox Building. Phone Broadway 472.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Seattle, Portland, Astoria, San Fran-

although one motorship of 12,000 tons was ordered towards the end of 1923. The East Asiatic fleet comprises 21 motorships, totaling 60,011 tons net. These vessels have been regularly used in services to China, Japan, Siam, Australia, North and South Pacific, and South Africa, and 42 round voyages were completed during the year. The company also maintains the Baltic-America Line, with five passenger steamers of 30,333 tons gross.

Astoria Shipbuilding Company was recently incorporated to operate a boat building plant at Astoria, Oregon. The incorporators are Joseph M. Dyer, Asme Mansker, and Clair Mansker, and capitalization is placed at $20,000.

The Prince Rupert Dry Dock & Shipyard, Prince Rupert, B. C., during April performed important damage repairs to the Canadian government steamer Canadian Scottish. Thirty-five plates had to be removed to allow access to damaged floors. The work was completed in thirty-four working days and many compliments were received by the management from inspectors and surveyors, both as to the quality of the work and the speed with which it was carried out.

ROUND-THE-WORLD

SAN FRANCISCO

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly between San Francisco, Honolulu, Kobe, Shanghai, Hongkong, Manila, Singapore, Penang, Port Said, Naples, Marseilles, Boston, New York, Havana and Los Angeles.
FREIGHT ONLY
REGULAR SAILINGS

LOS ANGELES

DOLLAR STEAMSHIP LINE
412 Merchants Exchange Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly between San Francisco, Honolulu, Kobe, Shanghai, Hongkong, Manila, Singapore, Penang, Port Said, Naples, Marseilles, Boston, New York, Havana and Los Angeles.
FREIGHT ONLY
REGULAR SAILINGS

UNITED KINGDOM---CONTINENTAL EUROPE

cisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

PACIFIC EUROPEAN LINE

Stanley & Ballantyne, agents.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco and United Kingdom and Continental Europe.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—From Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.

Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Broadway 5360.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co. Ltd., agents.
Yorkshire Building. Phone Seymour 575.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 54.
FREIGHT ONLY.
SAILINGS—Monthly sailings via Panama.

EAST ASIATIC COMPANY, LTD.

B. L. Johnson, Western Canada agents.
837 Hastings st. W. Phone Seymour 7147.
PASSENGERS AND FREIGHT.
SAILINGS—Regular services from Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with transhipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE

B. W. Greer & Son, Ltd.
602 Hastings street West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at U. K.

FRENCH LINE

Compagnie Generale Transatlantique.)
Empire Shipping Co., Ltd. Phone Seymour 8014
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver to Bordeaux, Havre, Antwerp and Hamburg.

FURNESS LINE

Furness Withy & Company, Ltd.
Furness (Pacific), Ltd.
1913 Stanford Bank Building.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Vancouver and other Pacific Coast ports to United Kingdom.

GENERAL STEAMSHIP CORP.

Empire Shipping Co., Ltd., 815 Hastings St., W. Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—From Pacific Coast ports to United Kingdom and Scandinavia, as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company, Ltd.
602 Hastings street, West. Phone Seymour 2377.
SAILINGS—Intercoastal Service
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

ISTHMIAN STEAMSHIP LINES

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
SAILINGS—Intercoastal Service
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

C. Gardner Johnson & Company, Ltd.
Metropolitan Building. Phone Seymour 357.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm, and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint service of The Royal Mail Steam Packet Co. and Holland-America Line.)
Royal Mail Steam Packet Company, agents.
Pacific Building. Phone Seym. nr 7108.
PASSENGERS AND FREIGHT.
SAILINGS—Regular services between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

PACIFIC EUROPEAN LINE

Canadian American Shipping Co., agents.
FREIGHT ONLY.
SAILINGS—From Vancouver, Seattle, Portland, San Francisco and United Kingdom and Continental Europe.

Mexico---Central America--Canal Zone---South America

SAN FRANCISCO

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

W. R. Grace & Company, general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports of Peru and Chile as inducements offer.

LATIN-AMERICA LINE

R. S. Silva & Company, general agents.
149 California street. Phone Sutter 7212.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Portland, Seattle and San Francisco to all ports on West Coast of Mexico, and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Portland, Seattle and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

McCORMICK STEAMSHIP CO.

215 Market street.
PASSENGERS AND FREIGHT.
SAILINGS—Every three weeks from San Francisco to San Ignacio, Cal., La Paz, Guaymas, Topolobampo, Mazatlan, San Blas and Manzanillo.

MEXICAN FREE PORTS S. S. LINE

Wheaton & Krueger, Agents.
320 Sansome st. Phone Sutter 2400.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to the West Coast of Mexico.

MEXICAN STATES LINE

Williams, Dimond & Company.
310 Sansome st. Phone Sutter 2400.
PASSENGERS AND FREIGHT.
SAILINGS—Every 28 days from San Francisco and Los Angeles to West Coast of Mexico and Central America.

PACIFIC LINE

The Pacific Steam Navigation Company.
570 Market street. Phone Sutter 4632.
PASSENGERS AND FREIGHT.
SAILINGS—Regular via Panama Canal, Guayaquil, Callao, Mollendo, Arica, Iquique, Antofagasta, Valparaiso, Talcahuano, Coronel, also to Havana and New York; also via Cristobal and Havana to Spain, France and England. Steamers connect at Panama for North Pacific Coast ports.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
430 Sansome street. Phone Kearny 2600.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PACIFIC MAIL STEAMSHIP CO.

508 California street. Phone Sutter 3800.
SAILINGS—West Coast Mexico-Panama (Passengers and Freight).
Twice a month between San Francisco, Los Angeles, calling at ports in Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Callao, Mollendo, Arica, Iquique, Antofagasta and Valparaiso. (Other ports as inducements offer.)

TOYO KISEN KAISHA

(Oriental Steamship Company.)
549-51 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via Honolulu.

SEATTLE

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 5706.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

W. R. Grace & Company, agents.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports of Peru and Chile as inducements offer.

LATIN AMERICA LINE

Lea Mathews Shipping Corporation
Alaska Building. Phone Elliott 4567.
FREIGHT ONLY.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Seattle, Portland and San Francisco to all ports on West Coast of Mexico, and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Seattle, Portland and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
Lobby No. 2, Central Bldg. Phone Elliott 6383.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
Alaska Building.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Callao, Mollendo, Arica, Iquique, Antofagasta and Valparaiso. (Other ports as inducements offer.)

LOS ANGELES

GENERAL STEAMSHIP CORP.

S. L. Kreider.
325 Pacific Electric Bldg. Phone TRinity 6356.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

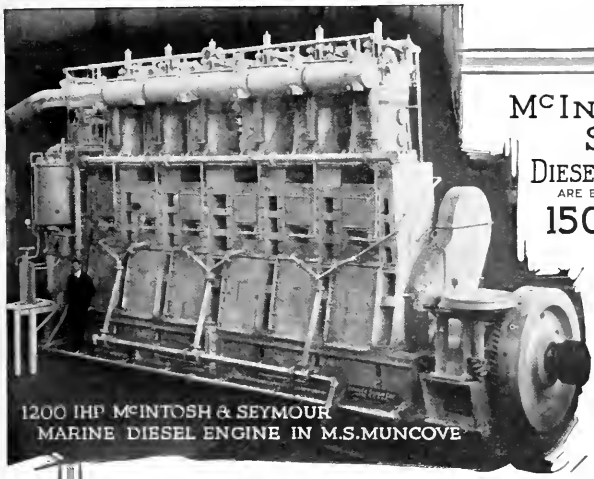
H. R. & M. F. McLaurin, Inc.
406 South Main street. Phone Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports in Peru and Chile as inducements offer.

MEXICAN FREE PORTS S. S. LINE

Wheaton & Krueger, 621 Chapman Building.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to West Coast of Mexico.

MEXICAN STATES LINE

Wheaton & Krueger.
621 Chapman Building.
PASSENGERS AND FREIGHT.



1200 IHP McINTOSH & SEYMOUR
MARINE DIESEL ENGINE IN M.S.MUNCOVE

McINTOSH & SEYMOUR
DIESEL OIL ENGINES
ARE BUILT IN SIZES FROM
150 TO 8000
INDICATED H.P.

SHIP OWNERS & OPERATORS
PLEASE STUDY THIS TABLE

	COAL FIRED STEAM VESSEL	CONVERTED TO MOTORSHIP WITH STEAM AUXILIARIES	CONVERTED TO MOTORSHIP WITH DIESEL ELECTRIC AUXILIARIES
Deadweight Tons	4125	4125	4125
Average Speed (Knots) . .	8.5	8	8
Average Fuel Per Day (Tons)	28	8	4½
Ton/Miles of Cargo per Dollar Fuel Cost	4300	9300	16,500

The above are actual results compiled from operating data of Sister Shipping Board Ships now operated by a prominent American shipping company.

THE MOTORSHIPS were fitted with

McINTOSH & SEYMOUR
DIESEL OIL ENGINES
FOR MARINE SERVICE

FULL PARTICULARS CAN BE OBTAINED FROM

McINTOSH & SEYMOUR CORPN

AUBURN, NEW YORK,

SALES OFFICES

330 HUMBLE BLDG HOUSTON, TEXAS
815 SHELDON BLDG SAN FRANCISCO, CAL
412 BISBEE BLDG JACKSONVILLE, FLA
501 AER BLDG KANSAS CITY, MO
16 S BALTIMORE AVE
140 BROADWAY NEW YORK CITY

PORT NOTES

(Continued from Page 324)

4. San Pablo Bay. A channel 35 feet deep and 500 feet wide across Pinole shoals up to Mare Island, with a turning basin 1000 feet wide in front of Mare Island quay wall.

Sacramento. For some years the possibility of constructing a ship canal from Sacramento to San Francisco Bay has been discussed, and finally a step toward establishing the feasibility of such a canal has been taken. The city of Sacramento and the county of Sacramento have each set aside a sum of $5000, which will be available July 1, for the purpose of carrying on a survey of the possibilities of such a canal. The canal would connect Sacramento and Suisun Bay (a branch of San Francisco Bay). The survey will contemplate four possible projects and will also study the significance of such a canal to the city of Sacramento.

The Pasig River, port of Manila.

The Southern Pacific Company announced that loss sustained when the wharves and terminal warehouses were destroyed at Sacramento the early part of May amounted to about $237,000, with a cost of replacement of about $300,000. Plans are now being made for the immediate rebuilding of the terminal wharves.

The Southern Pacific Company also sustained a heavy loss at Benicia when fire destroyed the ferry slips there. It is estimated that it will cost about $150,000 to repair damage to the slips.

Los Angeles, on May 6, approved a bond issue of $400,000 for the purchase or construction of a fire-boat for harbor protection.

Glenn A. Smith, vice-president of the Petroleum Export Corporation of Los Angeles, announced recently that the Pacific Marine Terminals, as a holding corporation of the Petroleum Corporation, is making preparations for the erection of a marine terminal consisting of six 6-story warehouses on the East Basin of Los Angeles Harbor. The estimated cost is $3,000,000.

Long Beach on May 6 approved a bond issue of $5,000,000 for harbor improvements. Some of the port improvement work to be undertaken were described in the April issue of Pacific Marine Review.

The Wilmington Transportation Company, operating excursion steamers from Los Angeles Harbor to Catalina Island, will transfer its terminals from Wilmington to Long Beach, if its application for suitable dock space is granted by Long Beach. A total of 500 feet of space will be required by the steamship line for its proposal terminal. The Pacific Electric Railway Company will construct its tracks out to the new terminal.

Vancouver, B. C. The Harbor Board on May 19 called for competitive plans for additions to two elevators for about 1,600,000 bushels of grain storage capacity with an expenditure of approximately $2,000,000.

New Incorporations

Williams Smith Lumber Company of California, San Francisco; capital stock, $900,000; subscribers, William Smith, M. C. Carey and Lydia Smith; attorneys, Carey & Gorfinkle, Merchants National Bank Building.

Navigator Instruments, Inc., San Francisco; capital stock, $75,000; directors, H. H. Kattelmann, E. H. Will, W. H. French, N. E. Linden, G. D. Bliss, Jr., C. C. Cole, and D. Sims.

Erikson Navigation Company, San Francisco; capital stock, $250,000; directors, C. Erikson, A. E. Stoltz, A. Parry, A. E. Perretti, and M. L. Epsteen.

Coast Lumber Company, San Francisco; capital stock, $50,000; subscribers, Byron Coleman, Julius S. McClymont, and Beatrice Nelson; attorney, Byron Coleman, 14 Montgomery street.

GOVERNMENT IN BUSINESS
(Continued from Page 306)

For years aggrieved persons and some of the trade have been agitating this question of lumber standards in Congress. Numerous bills have been introduced. if this effort succeeds no legislation will be necessary. This is keeping the government out of busines through the remedy of abuses by business itself.

The test of our whole economic and social system is its capacity to cure its own abuses. New abuses and new relationships to the public interest will iccur as long as we continue to progress. If we are to be wholly dependent upon government to cure these abuses we shall by this very method have created an enlarged and deadening abuse through the extension of bureaucracy and the clumsy and incapable handling of delicate economic forces. The old law merchant is the basis of much of our common law. A renaissance of a new law merchant could so advance our standards as to solve much of the problem of government in business.

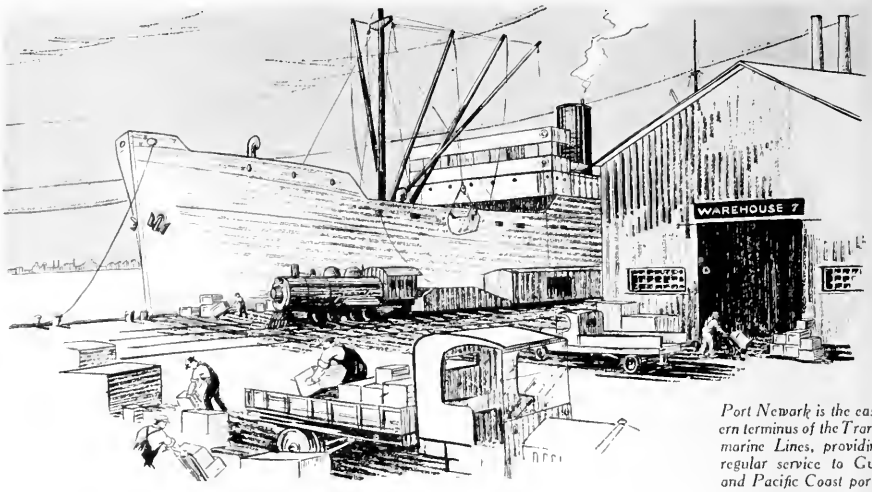
American business needs a lifting purpose greater than the struggle of materialism. Nor can it lie in some evanescent, emotional, dramatic crusade. It lies in the higher pitch of economic life, in a finer regard for the rights of others, a stronger devotion to obligations of citizenship that will assure an improved leadership in every community and the nation; it lies in the organization of the forces of our economic life so that they may produce happier individual lives, more secure in employment and comfort, wider in the possibilities of enjoyment of nature, larger in its opportunities of intellectual life. Our people have already shown a higher sense of responsibilities in these things than those of any other country. The ferment of organization for more definite accomplishment of these things in the practical day-to-day progress of business life is alive in our business world.

The government can best contribute through stimulation of and cooperation with voluntary forces in our national life; for we thus preserve the foundations upon which we have progressed so far—the initiative of our people. With vision and devotion these voluntary forces can accomplish more for America than any spread of the hand of government.

OCEAN SHIPPING
(Continued from Page 317)

Since the index numbers of wholesale prices here and abroad show that prices are 60 per cent or more above pre-war, it can be seen that shipping is worse off than industry as a whole. While some progress was made during the year in reducing operating expenses, shipping companies in general earned less than in 1921.

The world's tonnage of steel steam and motor ocean-going vessels increased 2,700,000 gross tons, or about 5 per cent, between June 30, 1921, and June 30, 1922, and only 1,400,000 gross tons, or 2 per cent, between June 30, 1922, and June 30, 1923. The most conspicuous gain in both years was made by Germany. The renaissance of German shipping since the war has no peace-time parallel. On June 30, 1921, only 611,000 gross tons flew the German flag, and a large part of the tonnage was comprised of coasting vessels. Two years later 2,435,000 tons were under German register.



Port Newark is the eastern terminus of the Transmarine Lines, providing regular service to Gulf and Pacific Coast ports.

Commerce has Recognized this Natural Distributing Center

THE flow of goods over the docks at Port Newark increases every week. It is the eastern distributing center for over a score of nationally known manufacturers, and inland shippers are taking advantage of its direct rail-to-water connections by consigning their overseas shipments through Port Newark. Port Newark has an unlimited future because, by virtue of its very location and development, it is a natural distributing center. It has direct switching connections with seven of the most important trunk lines to the west and south. It is connected by splendid motor highways with the greatest cities of the East. It is within the limits of New York harbor, where the world's commerce centers, and it is the only port in the harbor where direct rail-to-ship connections on a big scale are possible.

The need for warehouses at Port Newark is rapidly increasing. Foresighted executives are *now* acquiring land and leases on terms that in a few years will seem remarkably reasonable. If you are a progressive shipping executive you will want complete information about Port Newark. Write for the comprehensive free book "Port Newark" that gives all the details.

All the important cities of New England and the Middle Atlantic States, shown on this map, are within twenty-four hour motor-trucking distance of Port Newark.

THOS. L. RAYMOND, Director

Department of Public Improvements Newark, New Jersey

PORT NEWARK

Pacific Marine Review

The National Magazine of Shipping

JULY · 1924

Pacific Marine Review, Vol. 21, No. 7. Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. $2.00 a year.

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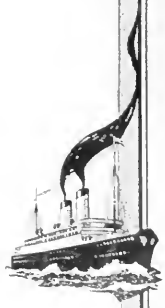

RUNNING FREE

In the good old days of sail American shipbuilders set the standards of the world in marine equipment alow and aloft. This illustration from a spirited drawing by Captain Andrew Baxter of New York depicts the good ship Ross Shire all set and running free before a stiff breeze.

Vol. XXI JULY, 1924 No. 7

Pacific Marine Review

THE NATIONAL MAGAZINE OF SHIPPING
576 Sacramento Street, San Francisco
336 AT 30 CHURCH STREET NEW YORK

J. S. HINES, Publisher
A. J. DICKIE, Editor
PAUL FAULKNER, Publicity Manager
BERNARD N. De ROCHIE, Business Manager

Official Organ of the Pacific American Steamship Association and the Shipowners' Association of the Pacific Coast.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879.

Published on the 25th of each month preceding the publication date. Advertising and editorial forms close on the 20th.
Subscription price, a year (domestic) $2.00
(foreign) 3.00
Single copies ..... .25

AMERICAN FOREIGN TRADE POLICY

Text of a Report Adopted by the Eleventh Annual National Foreign Trade Convention

THE foreign trade of the United States reached, in 1923, the very considerable aggregate or more than $26,500,000 for every working day of the year. It touched, directly or indirectly, in the production and distribution of the thousands of articles which composed it, practically every person in the country. There is no occupation that is not affected in some way by this large flow of exports and imports; no person, of whatever condition in life, who is not served repeatedly every day by it.

Besides the several millions of farms in the United States, the welfare of whose owners or occupants is intimately connected with this foreign trade, there are about 290,000 industrial establishments, very many of which both made constant use of raw materials necessarily obtained from foreign sources and are obliged steadily to sell part, at least, of their products in foreign markets. They must do that in order to keep plants and workers occupied, which is always the imperative condition of prosperity.

Foreign Trade a Necessity

Foreign trade is an absolute economic necessity if the development of American life is to continue along the lines on which it has proceeded ever since the first white men landed on these shores. The alternative is so unthinkable that its mere statement is all that is needed to expose convincingly its ridiculous impossibility. Strip our daily life of the myriad articles of comfort, convenience, amusement or necessity which depend wholly for their manufacture upon materials not produced and not producible in the United States, and there would be enforced upon us an inconceivable reorganization of our manner of existence. On the day when that was done we should revert to a life of savagery and nothing more. Take away from us only three things, rubber, silk, and tin, all of which come to us wholly from foreign countries, and it is impossible to picture the extent and effect of the deprivation.

It is extraordinary that in view of the simplest facts of our history and of the most obvious necessities of our present life there should still be any person in the United States believing in the possibility of economic self-sufficiency. Yet, unfortunately there are many of them, and included among them are men in high position, prominent in industry, commerce, finance and public life. It seems to be part of their pride in American achievement to hold that if we desire we might also live wholly to ourselves, with absolutely no call upon other countries either for markets or for supplies.

Such a view not only ignores some of the boldest features of world development, but also fails to recognize the great outstanding factor in the modern trend of civilization—the marvellous interdependence of all human relationships that has progressed with amazing rapidity, especially in the last few decades. It ignores the advancement in communication and transportation that has brought the whole world of today into a smaller compass than the smallest nation was a hundred years ago. It ignores the astounding improvement in the development and use of power that has revolutionized modern industry and immeasurably increased the productivity of man. It ignores the plainest facts of life.

Foreign trade is an absolute economic necessity. Our participation in it is not now, and never has been, within the scope of our preference or our convenience. We have foreign trade because it is an essential part of human existence, an imperative factor in the national and individual inter-relationships of the twentieth century.

Crystallization of National Purpose

How important it becomes, then, for these United States and these American people to develop a solidarity of will and a unity of purpose for the support and expansion of our foreign trade. How important it is that we should have a national foreign trade policy; how important to develop the favoring spirit, to promote the habit of friendly cooperation. For that is the sum and the substance of such a policy.

There are certain obstacles in the way. There are things to be done, and difficulties to be overcome. Crystallization of purpose on the part of a great people numbering more than a hundred and ten millions is not easy of accomplishment, especially when, as in this case, it is not plain to them that their individual personal welfare is affected. Particularly is it difficult when men in whose judgment there is some measure of public confidence continue mistakenly to point in the wrong direction. A serious responsibility of leadership rests upon men at the head of great institutions in this country, and it is urgently important that they should give very careful study and thought to the effect of their words before they give utterance to essentially unsound views as that of the economic independence of this or any other nation today. This misguided leadership is perhaps the chief obstacle at present in the way of the development of sound American foreign trade policy.

Essential Factors

The period that has seen our exports and imports grow from an aggregate of less than a billion dollars a year to more than eight times that has been one of marked and active advance in each of the four great factors which are the chief essentials of either domestic or foreign trade. There are production, transportation, communication and finance. Opinions will differ as to the order of their importance, but there will be no question that all are necessary to any well-rounded and complete machinery of trade. Nor can there be any question that we have all four highly developed so far as our domestic enterprise is concerned. It is only when we come into foreign trade that there is substantial room, as there is also need, for improvement.

Our inland transportation system is the most complete, the fastest, the surest and the cheapest in the world. Our domestic system of communication by mail, telephone and telegraph ramifies so far and wide throughout the country that it is literally possible for information of great events, as well as for business news of sufficient importance, to reach practically every person in the country within twenty-four hours. Our financial institutions cover the country with a network of branches and agencies which puts the most remote places within their reach.

Equipment for Foreign Trade

It is for this and similar reasons that the reputation of American business men for skill and enterprise in their domestic affairs has penetrated the far corners of the world. But when it comes to foreign trade ou requipment is by no means so thorough and efficient. Production we have in ample quantity and of the highest degree of efficiency. It is in transportation, communication and finance for foreign trade that we yield superiority to some of our competitors. While they have been working with the utmost diligence to build up for themselves systems of transportation and communication covering the trading world, and to parallel them with financial agencies of their own, we have been content to use their service, and even, in many cases where a start at American competition has been made, to prefer theirs to ours, not mfrequently supporting such preference by the assertion that the foreign service is cheaper or more efficient than our own.

It is not surprising to find, as we do today, the wide difference of sentiment and opinion regarding the effort to build up an American merchant marine. In the extremely important factor of foreign trade machinery, ocean transportation, there is energetic divergence of belief among Americans even as to the desirability, to say nothing of the necessity, of the maintenance of an American fleet. Very often it is argued that some of our competitors can render this service for us more cheaply and efficiently than we can do it for ourselves.

American Ships Indispensable

Indispensable to the successful development and maintenance of our foreign trade is a merchant fleet owned and operated by private American citizens. Much time has been wasted and many millions of idle words have been uttered and printed in discussion, but only a minimum of effective action has been taken toward assuring to this nation the permanent possession of this vital part of our necessary foreign trade machinery. Much has been heard about the handicaps laid upon American ships by American law or regulation.

But there is a thing which is vital, and which will surely overcome the handicap. That is support of American ships by American shippers. Nothing more than that is needed to insure the continued presence of the American flag in all the ports of the world. It lies in the will of the American people. It is not a matter of law, or regulation, or administration. It is not a question of subsidy, or bounty, or preferential treatment, or discriminating dues of any kind whatsoever. It is only the perfectly natural and legitimate preference of using existing facilities under the American flag.

The Favoring Spirit

This is an imperatively necessary feature of sound American foreign trade policy. It is not new. It has been tried and proved. There are ships today, privately owned and operated, which carry the American flag into every ocean. They carry American products to foreign shores and bring home cargoes of foreign materials necessary to our industry. They are subject to every particle of handicap that burdens any American ship, whether it arises out of law, or regulation, or economic condition, or any other circumstance. Yet they succeed, and their success is proof that it can be done. They succeed because, either on account of skill of management or other fortunate situation they carry cargo on most of their voyaging, homeward as well as outward. They work their way around the world, and are paid for their work.

Repeated National Foreign Trade Conventions have declared their earnest belief in the policy of American support for American ships. From the time of its organization ten years ago, the National Foreign Trade Council has steadily urged that policy. It would provide the greatest subsidy that could be given. It would assure a permanent American merchant marine. Congress has formally declared it to be the policy of the United States to have a merchant marine privately owned and operated, and has done what it could to pledge the country to take whatever steps may be necessary to fulfill that purpose. But this is a matter that is beyond the power of any legislative declaration. It lies in the will of the people themselves. It is for them to determine and to act. When they do so the issue will be settled. The support of the American people will insure an American merchant marine. Nothing else will, and nothing more is needed.

Financial Factor

Finance performs two great services in the maintenance and promotion of foreign trade. It facilitates individual purchases and sales, and it paves the way for new transactions. The first is the daily routine of exchange, and as it is handled freely and helpfully or reluctantly and with restriction, the foreign trade is facilitated or hampered accordingly. Very much depends upon the attitude of the financial institutions toward international commerce. There is great divergence of opinion between some bankers and some foreign traders as to the extent to which the banks should go in furnishing facilities for this business. The question is the subject for discussion in another session of this convention, and it is not necessary to go into it here. But it is obviously desirable that friendly agreement should be reached, so that friction should be minimized. The importance of the favoring spirit on the part of the banks can hardly be over-estimated.

It is in the field of investment in foreign countries that American finance has its largest opportunity for

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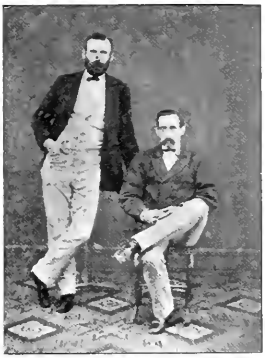
TRANS-PACIFIC SIDE WHEELERS

A Personal Interview With the Only Living Member of the Crew of the Pacific Mail Steamship Company's Steamer Colorado on the First Trans-Pacific Passage of a Passenger Steamer

By WILLIAM P. LINDLEY

Steamer America burning in Yokohama harbor, August 24, 1872

ON New Year's Day, 1867, the first American steamer sailed from San Francisco for Japan. She was the Colorado, owned and operated by the Pacific Mail Steamship Company. Previous to this sailing the Colorado had been plying between San Francisco and Panama. The only changes made in her structure before undertaking the new venture was that her guards, forward and aft of the paddle-boxes, were cut away, and strength added to her bulwarks at these points.



Chief Engineer Willie Waddell (standing) and Henry Worsdale, steward.

Probably there is but one man now living who made that voyage. He is Henry Worsdale, who, at the time mentioned, was 23 years of age and went out as pantryman on this, the first, Oriental voyage of the Colorado. Mr. Worsdale continued in the service of the Pacific Mail Steamship Company for forty years continuously, rising to the position of chief steward, which place he held until 1907, when he retired. He is now, in his eighty-first year, enjoying a quiet life on a country place at Los Altos. With him is Mrs. Worsdale, and the two elderly folks, both very active and mentally alert, are closing the evening of their years surrounded with all the comforts due them for their long lives of energy and work.

Mr. Worsdale, speaking of the memorable voyage, says that the Colorado was under the command of Captain George Bradbury at the time, the chief officer being Mr. Marshall, and the second mate, Mr. Douglas. On the outward voyage she went the "middle route," so called, instead of the Great Circle course. The outward voyage was uneventful though somewhat lengthy, consuming about a month.

Coming back, the Colorado was taken over the Northern or Great Circle course, as the prevailing winds being westerly she would thus get the benefit of them, and her sails would help; for, while a steamship, the Colorado was rigged with sails as a barque.

Her engine was of the single cylinder beam type, like those on the San Francisco ferryboats Newark and Bay City, though of an older kind. Her boilers were of the flue design, and maintained a steam pressure of around twenty pounds per inch. Of course, they were jet-condensing engines, as the surface condenser had not then been introduced for sea use. To the layman this means nothing, but is explained by the fact that the jet condenser has to use sea water, with all its salt, for boiler water, and this has to be constantly renewed, as the water becomes salt saturated. In the surface condenser the steam, which is fresh water in vapor form, is condensed on the surface of metal tubes, which are cooled by flowing sea water through them, thus giving a pure, fresh water to the boilers. Without this the advancement of marine engineering would have been slow indeed.

Willie Waddell was the chief engineer on this voyage, and he was afterwards port engineer for the company, serving in this capacity for many years.

There were but four or five passengers, and but very little freight was taken on the voyage, either outward or back. It was many years before the trade, started in so small a way, was built up by the energy of the company to its present colossal magnitude. And Mr. Worsdale, the subject of this sketch, saw this phenomenal growth.

Reviewing some of the incidents of the voyage, the old seaman tells of the curious laws the Japanese had at that time. No one was allowed to go on shore without a special permit, and then the Japanese authorities would send a bodyguard with the visitor, who was constantly under surveillance until back on the ship again. At that time Japan had been but a few years open to any sort of commercial intercourse, and the habits of centuries of a hermit nation were hard to break.

Another thing on board the Colorado would surprise present day tourists. That was two cannons, mounted on carriages on the main deck, and supplied with plenty of powder and grape shot. They were kept as a protection against the pirates of the Japan and China seas, and were very necessary adjuncts to any vessel, as the sea thieves stopped at nothing, and many a good ship was taken by them. These cannons were of the old naval type, and picked gun crews were carried.

Hongkong was also visited, and this port was then nothing much more than a naval station for Great Britain. Here, though, shore-going restrictions were not rigid, and the crew of the Colorado had a fling ashore after the long trip.

As before stated, very little cargo was carried, either outward or homeward. Coal in plenty was needed and taken, as the old style engines were fuel eaters to a marked degree. The sails were used continuously when-

(Continued on Page 370)

Pacific Marine Review
The National Magazine of Shipping

OUR CREED

We believe in presenting, with Pacific Ocean emphasis, a broad survey of American Merchant Marine activities, to the end that Pacific American marine operating problems may be solved through contact with the best experience of the maritime world.

We strive for conservative accuracy.

We welcome constructive criticism.

We serve the American Merchant Marine.

A. J. DICKIE,
Editor.

Equipment

THE designer of seagoing merchant vessels has always had an equipment problem, the solution of which is invariably a compromise. This problem has developed great proportions with the growth in complexity of our modern life. A modern passenger liner must be able to float with all the conveniences and luxuries demanded in our first-class hotels ashore, and with the necessary power plant to propel her through the water at express speed. For periods ranging from four to twenty days, she must be absolutely self-contained, self-sustained, self-sufficient. Her equipment under such conditions becomes a problem of the utmost importance.

In this issue will be found a number of articles dealing in a broad general way, with propulsive equipment, and with the reaction of equipment on various phases of ship operation. Obviously in a single issue the subject can be covered only in a very sketchy fashion, and many fine articles submitted for this number are being held for future use.

American genius developed a line of equipment for sailing ships that set the standard for the world, and the Great Lakes American engineers produced material handling machinery of surpassing performance. At the present time the best engineering and executive talent in America is in consultation over standards for equipment and fittings in all departments of engineering, including marine. We may, therefore, indulge in the hope that we shall shortly be able to publish basic American standards for all classes of marine equipment and ship fittings and that these standards will set a new world record for economy and efficiency on American ships.

The Favoring Spirit

THE shipbuilders, shipowners, and ship operators of the United States have often urged upon American business men the necessity of supporting American ships and American shipyards. The National Foreign Trade Council, in its yearly pronouncements of foreign trade policy, has consistently declared its "earnest belief in the policy of American support for American ships. . . . It would provide the greatest subsidy that could be given. . . . It would assure a permanent American merchant marine . . . nothing else will, nothing more is needed."

The entire report on American foreign trade policy as approved by the Eleventh National Foreign Trade Convention is reproduced elsewhere in this issue of Pacific Marine Review. For additional emphasis a portion of the report as it touches the merchant marine is here repeated.

"Indispensable to the successful development and maintenance of our foreign trade is a merchant fleet owned and operated by private American citizens. Much time has been wasted and many millions of idle words have been uttered and printed in discussion, but only a minimum of effective action has been taken toward assuring to this nation the permanent possession of this vital part of our necessary foreign trade machinery. Much has been heard about the handicaps laid upon American ships by American law or regulation.

"This is an imperatively necessary feature of sound American foreign trade policy. It is not new. It has been tried and proved. There are ships today, privately owned and operated, which carry the American flag into every ocean. They carry American products to foreign shores and bring home cargoes of foreign materials necessary to our industry. They are subject to every particle of handicap that burdens any American ship, whether it arises out of law, or regulation, or economic condition, or any other circumstance. Yet they succeed, and their success is proof that it can be done. They succeed because, either on account of skill of management or other fortunate situation they carry cargo on most of their voyaging, homeward as well as outward. They work their way around the world, and are paid for their work.

"It is not surprising to find, as we do today, wide differences of sentiment and opinion regarding the effort to build up an American merchant marine. In the extremely important factor of foreign trade machinery, ocean transportation, there is energetic divergence of belief among Americans even as to the desirability, to say nothing of the necessity, of the maintenance of an American fleet. Very often it is argued that some of our competitors can render this service for us more cheaply and efficiently than we can do it for ourselves. It is not yet ten years since disaster fell upon the agriculture, commerce, and industry of the United States simply because we had

depended upon foreign ships to do our ocean carrying and had practically none of our own for the deep sea trades."

The American merchant marine can certainly absorb liberal applications of the attitude which the late President Harding loved to name "The Favoring Spirit."

Section 28

WHILE temporarily moribund, Section 28 is by no means dead. It is in exactly the same status as it was before the Shipping Board issued its late certification to the Interstate Commerce Commission. The section is still in the Merchant Marine Act and may become operative at any time at the option of the Shipping Board.

This being so, all ship operators and all shippers by sea should study very carefully the effect which enforcement of Section 28 might have on their operating profits. In order to stimulate discussion, Pacific Marine Review is enlisting the help of experts and in the August issue will begin a series of articles analyzing the application of Section 28 to Pacific Coast shipping problems.

Naval Ratios

THE Disarmament Conference 5-5-3 naval ratio seems again open for discussion. Secretary Roosevelt's recent report indicates the actual present ratio as 5 for Great Britain, 4 for the United States, and 3 for Japan. These ratios show comparison of actual fighting ships. Under modern conditions, the effectiveness of fighting ships is dependent on merchant marine of suitable type. The National Merchant Marine Association recently certified to the House Committee on Merchant Marine that the merchant marine ratio covering types suitable for war needs stands now at 5 for Great Britain, 1 for the United States, and ½ for Japan.

Congress has passed the legislation necessary to correct the ratio in fighting ships, and as soon as appropriations are available a naval building program will be moving. Congress, however, has taken no action to encourage the building of those special types of merchant vessel most suitable for auxiliary naval use.

The Shipping Board has some funds available and is considering plans as evidenced by the following recent declaration by its vice-chairman, E. C. Plummer.

"Today the Shipping Board has before it the completed plans for two passenger steamships which in design and provisions for luxurious comfort and efficiency as servants of the flag will be unsurpassed. Not only that, but the special committee appointed by the Chief Executive and made up of national leaders in industrial and transportation affairs is recommending five other vessels of the most improved combination passenger and freight ships; so that you can look forward to having in the immediate future a magnificent addition to the fleets which you now serve, and you can tell your clients and the world, as well, that the United States is on the ocean to stay."

This would certainly be a long step in the right direction and would go far toward a sorely needed revival in new construction for American shipyards.

The Federal Attitude

SO far as merchant shipping is concerned, the policy and attitude of the Federal government is directed through the Shipping Board. As broadcasted to the American people recently by the present chairman of the Shipping Board, "Our ships are sailing to all parts of the world. On the decks are American crews scattering our goods to the far corners of the earth. Our passenger ships are receiving more and more patronage and support by our people.

"As a commercial proposition benefiting the farmer, the manufacturer, the producer—in fact, the whole people of the United States—our merchant marine is a paying proposition. As a means of national defense it is indispensable. No real American would discourage its upbuilding. We must have a merchant marine under the American flag composed of ships built in American yards, manned by American seamen, and owned by private American capital if possible, but a merchant marine anyhow. We need the assistance and the cooperation of the farmer, the manufacturer, the railroads and the shipowner, for they all have a community of interests. Let us together act as our foreign competitors are acting, and the result will be an increase in our foreign trade, more business for our merchant shipping, and increased prosperity for all."

This expression is flawless, no exception can be taken to it. Every shipowner can subscribe to it, and if such a platform were to receive the whole-hearted endorsement of Congress and all the governmental departments, there would be an end to most of our merchant marine troubles. All that any American shipowner could ask would be that the "We" and "Us" of this declaration include both branches of Congress and all of the Federal departments, so that there would be genuine cooperation in cleaning up old legislation, antiquated inspection rules, obsolete port pratique, and cumbersome red tape.

Let's make it profitable for American shipowners to operate under the American flag.

San Francisco Knows How

ONCE more San Francisco shipping interests are leading the world in marine engineering progress. We led out with the first turbo-electric ferries, the first diesel-electric ferries, the first diesel-electric tankers, and now comes the first new construction in turbo-electric seagoing passenger liners, a five million dollar job, with twenty-one knots average sea speed, and accommodations to take care properly of 500 first-class cabin passengers.

Our congratulations to the Matson Navigation Company for thieir pioneering spirit; to the General Electric Company for their engineering enterprise; and to the William Cramp & Sons Ship & Engine Building Company on the successful bid.

LUBRICATION ON SHIPBOARD

An Open Forum for the Discussion of Lubrication Problems Facing the Operating Engineer in the American Merchant Marine

Question No. 1.—Have two Engberg crankcase engines of the dynamo flat of my ship. After a few hours' run the oil turns yellow and becomes thick, stops my oil pump, and causes lots of trouble. We are using the best grade of red engine oil. What is the trouble?

Answer.—The contributing cause is the introduction of water to your crankcase by condensation finding its way down the rod from your cylinder. The fact that the oil forms an emulsion shows it to be unsuitable for your work. Very few red engine oils are to be recommended for enclosed crankcase work. What you want is a good medium turbine oil of United States Government Class "C" specifications and your trouble will be over.

Question No. 2.—What oils are best to use on deck machinery?

Answer.—On open gears use a gear compound which will cling to the metal, resist Tooth pressure, and reduce wear and noise. Swab your rods with cylinder oil and use compounded marine engine oils for general lubrication. To lay up deck machinery, swab all bright parts with steam cylinder oil mixed with graphite.

Question No. 3.—Am operating a 3000 horsepower steam turbine at 3600 r. p. m. The oil turns almost black in 48 hours. We thoroughly cleaned the system when we changed the oil, but it made no difference in the results.

Answer.—Your question does not state whether it is direct drive or geared, the make of the turbine, the capacity of the oil sump, the operating temperatures, or whether you have an oil cooler installed; but from your description of the performance of the lubrication, it is apparent that you should change to another make of oil. Turbine oils are subjected to heat and rapid circulation and to a certain amount of condensation finding its way in and should be designed to stand up under these conditions. The United States Government Class "C" specifications on turbine oil covered the situation clearly and by demanding an oil to comply with these specifications, you will eliminate a lot of your troubles. If you will state fully all your operating conditions in the next issue, we will endeavor to answer fully and in detail.

Question No. 4.—Our thrust block has given us a lot of trouble lately by running hot. We have been using dynamo oil for the past two trips. Would this account for the trouble?

Answer.—Your troubles may be mechanical. Check over your horse shoes and ascertain whether the thrust is evenly divided. Two or three of the shoes may be carrying the entire load. Dynamo oil is not the best product for this purpose however. A compounded marine engine oil such as you use on your crossheads, pins guides etc, would be better. This oil floating on the body of the water in the sump will emulsify and form a beautiful lather, which will provide a perfect lubricant. Be sure to keep your wick feed free from water.

Question No. 5.—The ice machine on our ship is far from satisfactory. We cannot keep our temperatures down and it seems to get worse each trip. Could this be laid to the oil we are using? My first assistant engineer sooms to think so.

Answer.—Lubricating oil for refrigeration work should possess certain specifications: first, it should be of low cold test and, second, free from moisture. An oil of high cold test, when carried over into the coils, will congeal on the inside of the tubes, and as oil is a bad heat conductor, the capacity of the condenser and evaporator will be greatly reduced. If moisture is present, it will cause the oil to freeze and congeal in the expansion valve and coils. In either case, you will have your coils insulated on the inside and your plant will become less efficient each day. Speeding up the compressor will make no difference and the only remedy for such a condition is to steam out your coils and remove all deposits and start clean with a brand of oil which will meet the following conditions: Low cold test of 0°F.; viscosity of about 200 at 100°F.; the oil must be absolutely free from acids and moisture and should be straight mineral. If you are not equipped with an oil separator between your compressor and coils, would recommend that you install one at once and purge same frequently to avoid accumulation. This explanation will assist you if your oil is at fault, but look over your installation for broken valve springs, leaky valves, leaky piston, clogged expansion valve, too small amount of ammonia in the system, or the presence of air in the system, which will be indicated by excessive pressure. Purge out the system in the usual manner.

Question No. 6.—What kind of oil is best for swabbing piston rods on the main engine?

Answer.—Due to a certain amount of condensation always being present, the rods should be swabbed with the best grade of steam cylinder oil compounded with about 5 per cent of acidless tallow oil. This combined with the water will form a smooth emulsion, which will reduce frictional wear on your rods and packing. On high pressure rods and valve stems, it is good practice to operate with your packing gland suction pipes closed, which will allow the condensation to follow the rods instead of being drawn back into the condenser. A little water is lost this way, but it means elimination of hot rods and saves packing troubles. This is especially true where superheat is in use.

Question No. 7.—All of our main journals run hot. We have to use cylinder oil to hold them. Why will not the regular marine engine oils do? Other jobs get along with it.

Answer.—Your question suggests mechanical trouble. Check up on your thrust your throws may be riding the after end of your main journals. Examine the bottom half of your journal boxes, the babbitt may be wiped and the oil grooves may be filled up. Your water service may be stooped. A set of leads will help you to determine if your clearances are O. K. A good grade of compounded marine engine oil or a straight mineral oil will take care of any set of journals, provided the mechanical conditions are right.

Question No. 8.—What is meant by the term "fluid friction?"

Answer.—Fluid or internal friction can best be understood by considering a shaft revolving rapidly in its journal, the shaft being surrounded by a perfect film of oil. The oil next to the shaft will be revolving at practically the same rate as the shaft, the oil next to the journal will be practically stationary. The friction of the particles of oil sliding past one another is fluid friction. Measured, it is known as viscosity.

A QUESTIONNAIRE

Many questions on lubrication come to us from operating engineers and from steamship executives. These questions range from inquiries as to the best grade or type of oil for a specific purpose up to demands for highly specialized information on the chemistry and technique of oils and greases.

We are, therefore, starting in this form of question and answer discussion a department devoted to lubrication.

We invite questions; we urge constructive comment of answers.

Our aim will be to have all questions answered by expert lubrication engineers and to publish all constructive criticism.

This initial page is made possible through the cooperation of the Associated Oil Company staff of lubrication engineers.

PACIFIC COAST-EUROPEAN TRADE

Past History and Future Prospects

By DANIEL G. COOKE
Well Known Pacific Coast Traffic Expert

ONE of the first of the important trade routes from the North Pacific was to Europe. After the gold excitement of '49 subsided and the population of California settled down to the fact that the real future of the state rested in development along agricultural lines, a regular trade of considerable importance developed in the carriage of grain, and later on, when the development of fruit growing had reached an extensive scale, the new Pacific trade with Europe developed one of the world's greatest trade routes.

The first important port in this trade on the Pacific was San Francisco, and the trade was carried on principally with London and Liverpool, as these markets were the distributing centers for practically all of Europe. All of the trade was done with sailing vessels and at one period, just after the Civil War, the American ships were quite a factor in this trade, together with British, French, and German sailing ships.

Outward to the Pacific Coast, vessels carried practically full cargoes consisting of cement, fire clay, coke, steel, and general European merchandise. In other words, cargoes were obtained in both directions.

As the territories of Oregon and Washington became more populated and their fertile lands began producing wheat in large quantities, together with their forests, coal, and fisheries, commerce through their seaports with Europe grew in leaps and bounds. Columbia River and Puget Sound ports developed an extensive trade with Europe, exporting their products in large quantities. The same condition also applies to the port of Vancouver in British Columbia.

The package freight business, such as wine, canned goods, dried fruits, and honey, was principally carried by the Pacific Mail Steamship Company and transshipped to Atlantic liners across the Isthmus of Panama. The Pacific Mail Steamship Company controlled this trade until about 1900, when British and German shipping interests, visualizing the future of this trade, inaugurated direct steamship services.

The Blue Funnel Line (British) selected the Suez route and made Puget Sound its Pacific Coast terminus. The Kosmos Line (German) chose the Magellan route and made San Francisco its terminus. Both services were successful from the start, and for a great many years these two companies controlled the general cargo trade with direct steamers. A few years later the Harrison Line and East Asiatic Company entered this trade, both selecting the Magellan route.

The opening of the Panama Canal in 1915, which shortened the distance from the Pacific Coast to Europe by about 6000 miles, changed the complexion of things relative to this trade. Most of the powerful European steamship lines had plans made and were figuring on direct steamship service with the Pacific Coast via the Panama Canal. The World War, however, altered plans of practically all of them and only one line, the Johnson Line of Stockholm, Sweden, carried out its plans. The other companies who planned services to this coast were drawn into the war, as their vessels belonged to countries engaged in war; namely, Germany, Britain, France.

When hostilities ceased in 1918 the world's shipping companies again figured on proper trade routes for the employment of their fleets, and today we have the following powerful shipping companies with services in this trade:

Blue Funnel Line (Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.)
East Asiatic Company, Ltd.
Ellerman's Wilson Line, Ltd.
French Line (Compagnie Generale Transatlantique).
Furness Line (Furness, Withy & Company).
Harrison Direct Line.
Isthmian Steamship Lines.
Johnson Line.
North Pacific Coast Line (Royal Mail Steam Packet Company and Holland America Line).
Norway Pacific Line.
Pacific European Line.
Societe Generale de Transport Maritimes a Vapeur.
United American Lines, Inc.

From the above you will note that there are thirteen regular lines now engaged in this trade. Prior to the opening of the Panama Canal there were only four. Therefore, we have today nine additional lines

THE WELL-KNOWN WILLHILO

An important member of the Williams Line intercoastal fleet, operating in coast-to-coast freight service between New York, Philadelphia, Baltimore, Norfolk and Los Angeles Harbor, San Francisco, Oakland, Seattle and Tacoma. This view is from a "snap-shot" taken off the Golden Gate. From the collection of A. F. Zipf, the Williams Line Pacific Coast chief.

which have entered the trade since the opening of the Panama Canal.

The writer has no hesitancy in stating that the average well informed shipowner has definitely decided that the Pacific Coast-European trade has one of the most promising futures of any trade route. There is no disputing the fact that the Pacific Coast from Vancouver to San Diego is the fastest growing territory in the world and perhaps the richest. At any rate, we do not believe these new steamship lines which have entered the trade since the termination of the war figured on immediate profits, but are playing futures, and in this connection I for one agree with them—they are following a wise policy.

Regarding the types of ships most suitable for the trade, the motorship, of course, is the first essential. I believe the following specifications would be most suitable for the run:

Type	Motorship
Deadweight (approximate)	11,000 tons
Cargo capacity (approximate)	9,000 tons
Refrigeration capacity (approximate)	1,000 tons
Speed (approximate)	13 knots

The specifications outlined above, in my opinion, are the most advantageous for this route for the following reasons:

(1) Motorship—A necessity on account of long run, making for economy in operation, without which no line can be successful in this trade.

(2) Cargo Capacity—I consider 10,000 tons cargo capacity the proper sized vessel, as the trade is seasonable and there are naturally slack periods when good paying cargo is not plentiful.

(3) I consider 1000 tons refrigerating compartments ample to meet requirements for the following reasons: Dried fruit is seasonable, only lasting about three months of each year (canned goods do not require refrigeration), and the apple season only lasts about two months of each year.

(4) Speed—I consider 13 knots essential in order to make an average time in transit to first port not to exceed 26 days. Faster ships would prove too expensive and slower speed would not advantageously compete with intercoastal steamers and transshipment at New York to fast Atlantic express steamers.

The question has often come up relative to the advisability of having a few limited first-class accommodations on the European steamers. My investigations on this point would make me answer in the negative for many reasons, which I will cover here.

The plan of carrying a few first-class passengers, say fourteen to twenty, has never worked successfully in any other trade. In view of the rail route connecting with fast express steamers across the Atlantic with fares less than the through rate via the Panama Canal, and due to the average passenger desiring speed, the all-water route would not be attractive. Further, it is necessary to maintain a high standard of service in order to cater to first-class passengers, and sufficient numbers cannot be secured to make the feature remunerative.

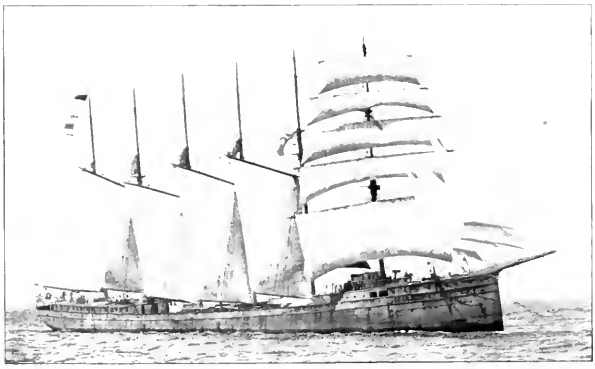
While on the question of passengers, I do believe, however, that if the immigration bars are lifted and some of the better class of immigrants from Europe could be brought to the Pacific Coast as agriculturists to further develop the land, then we can look forward to some of the larger trans-Atlantic passenger steamers being diverted to this coast.

In the last year or so a large grain export trade has developed from the port of Vancouver. For example, 121,692 tons were shipped to Europe during the month of April, this year. The movement formerly cleared via the Great Lakes, but on account of this route being closed by ice about six months of the year, Vancouver has been found more advantageous, as grain can be cleared from this Pacific Coast port every day in the year. The Canadian grain is practically all shipped in bulk.

Columbia River and Puget Sound ports also ship considrable grain, while San Francisco clears an enormous amount of barley each year for the European market. Of course, the large grain movement is partially taken care of by the thirteen regular lines engaged in this trade, but the bulk of the grain is carried by the well-known tramp steamers which are always on hand at any port supplying full cargo shipments.

The regular lines at the present time are traveling in both directions with full cargos, for at all times when general cargo is scarce they can fill up remaining space with grain. Rates ruling in this trade today are better than in any other world trade, and while some are extremely low in themselves, indications are they will remain at present figures for some time.

Summing up the situation, we can look to see in the future great advancement in types of ships installed in this trade, as the operator is faced with the problem of moving large quantities of tonnage at moderate rates. To meet this the only solution is the employment of economical motorships making quick deliveries of cargo.



The barkentine City of Sydney, cannery tender at Bristol Bay for the Union Fish Company of San Francisco. This vessel was formerly the Pacific Mail steamer City of Sydney and a great favorite of the trans-Pacific run. This photo is through courtesy of R. P. Rasmussen, manager of Simpson & Fisher, Inc., sail makers of San Francisco.

WEBB INSTITUTE OF NAVAL ARCHITECTURE

Splendidly Endowed Institution in New York Provides a Fine Opportunity for the Young Men of America to Obtain a Free Education in Naval Architecture and Marine Engineering

ON June 5 last the annual graduation exercises of Webb Institute of Naval Architecture were held. This year there were but seven graduates, an unusually small number. The speakers were Stevenson Taylor, president of the Institute; Frank L. Dubosque, superintendent of floating property of the Pennsylvania Railroad; the Hon. John B. Eustis, and Mr. Livingston of the graduating class.

This Institute is located at Fordham Heights in the Bronx and commands a magnificent view from the hill on which it is placed of the upper part New York. The college building has recently been thoroughly rebuilt and placed in splendid condition at a cost of over $75,000.

A brief resume of the starting of this Institute will be of interest to all concerned with shipbuilding in this country.

It was founded by William H. Webb, probably the greatest American shipbuilder who ever lived. Before his death he set aside a large portion of his fortune to found what was then known as Webb's Academy and Home for Shipbuilders. He associated with him in the management of the Institute nine men of outstanding prominence in the maritime affairs of the country. The sole survivor of this original nine is Stevenson Taylor, who has been intimately connected with this Institute ever since its founding. The capacity of the Institute is sufficient to house at least fifty students and a corresponding number of "guests," the appellation of those men who have worked in American shipyards and their wives, who are allowed to spend their declining years in ease and comfort in this home, due to the munificence of its founder.

There is an unusually good opportunity at this time for young men to receive a thorough education in naval architecture and marine engineering at this Institute. It is designed primarily to aid the sons of those citizens who otherwise could not afford to give them a college education. In this way the Institute is unique, as by its policy any young man in the United States who is anxious to enter the shipbuilding field and receive a good general engineering education can do so entirely without cost to himself except for the clothing which he wears. Tuition, books, board, and even laundry, are provided absolutely free to young men fortunate enough to be enrolled in this school.

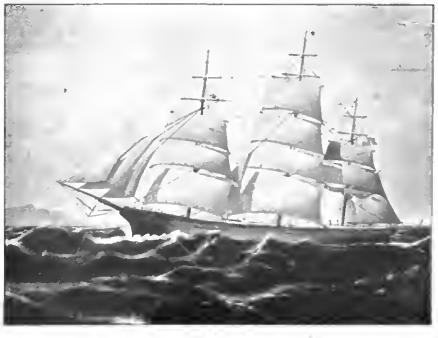
The requirements are that candidates must be natives or citizens of the United States, unmarried, in good health, of good character and standing, and of an age not less than fifteen nor more than twenty-one years. The applications for admission must be made out in the applicant's own handwriting and filed with the resident manager not later than the first of September each year. The application must be accompanied by a letter from parent or guardian stating that the application is made with the knowledge and consent of parent or guardian, by a certificate from the applicant's last teacher containing a specific statement of the studies the applicant has taken and the time spent upon each, to qualify him as a candidate for admission, and by certificates of good moral character from his last teacher and from one or more citizens of good standing.

The appointments are made as a result of competitive examinations and those who expect to be successful must have had a high school education or its equivalent. Candidates are examined in arithmetic, algebra, plane geometry, solid geometry, and English.

Applications should be addressed to the resident manager, Sedgwick avenue and 188th street, New York City.

The affairs of the Institute are conducted by a board of trustees, who are prominent in the shipping industry of the country. They are: Stevenson Taylor, president, who is also president of the American Bureau of Shipping; Walter M. McFarland, president of the American Society of Naval Architects and Marine Engineers; G. P. Taylor, secretary and treasurer, vice-president of the American Bureau of Shipping; and Lewis Nixon, Thomas F. Rowland, Jr., William J. Davidson, H. A. Marvel, E. P. Morse, M. G. Kindlund, M. E. Davis, P. J. McAuliffe, Captain C. A. McAllister, J. Howland Gardner, W. D. Hoxie, and Joseph W. Powell, all of whom are prominent in the shipping interests of the country. The dean of the faculty is Professor A. C. Besselievere, a graduate of the Massachusetts Institute of Technology and a well-known naval architect.

Although the outlook for shipbuilding in this country at present may be somewhat dark, it must be understood that the United States will always have a merchant marine which will rank second or third in the world, even if we have no ships in the foreign trade. The vast fleets of coastwise vessels, of Lake vessels, of yachts, and of river craft will make a constant demand for naval architects and marine engineers of the highest standing. This is an unusual opportunity for enterprising young men to enter this profession, even though they may not have sufficient means to pay for their education.



An American clipper under full sail.

THROUGH THE BIG DITCH

Remarkable Record for Safety of Operation and Some Notes on Curious Cargoes which have Recently Made Transit of the Panama Canal

By C. H. CALHOUN

ALTHOUGH the transit of the Panama Canal is a comparatively difficult operation with the ships being lifted up three flights of locks to the level of Gatun Lake, over eighty feet above the sea, and then lowered again to sea level, after the passage through Galliard Cut (formerly Snake Cut) which until recently has been afflicted with slides and changes in the topography of its bottom, there have been few accidents of any importance to vessels using the great Isthmian waterway.

One of the most important accidents of recent years was the grounding of the Jugo-Slav ship Izgled near the famous Cucuracha (cockroach) Slide, due to the breaking of a link in the steering apparatus. The collision caused a leak that resulted in hold No. 1 of the vessel filling with water and made it necessary for a salvage tug to pump the vessel clear and assist in the passage to the Balboa marine shops, where repairs were made.

One of the Canal Commission's big floating cranes handling railroad equipment.

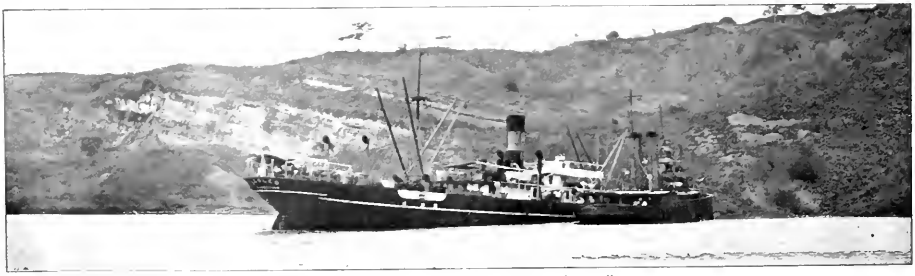
During the fiscal year 1923, when traffic was the heaviest in the history of the canal, there were only two accidents of any importance to vessels in transit through the canal. In one of these, investigation showed that the accident was due to an inexperienced helmsman and a possible derangement of the steering gear, and not to negligence or lack of care on the part of any employe of the Panama Canal. In the other case the Panama Canal agreed to share the responsibility and assume one-half the cost of repairs, estimated at eighteen thousand dollars.

The annual report of the governor shows that there were eight other accidents that required the investigation of the Board of Local Inspectors, and this report included all vessels making the canal transit during the year as well as the vessels that entered and cleared at the terminal ports without going through the canal. There were 9116 vessels entered and 9113 cleared at the two ports during the year, and 3967 vessels made the transit of the canal.

During approximately ten years of operation, during which time considerably over 20,000 vessels have made the canal transit, the total amount of damages to vessels for which the canal was responsible was $92,079.25, making an average of approximately $9000 a year. The year in which the most expensive accidents occurred was 1919, when the Panama Canal paid out $26,525.65; but since that time, in spite of the enormous increase in traffic, the amount has been reduced each year. The total expense to the Panama Canal on account of damage to vessels in 1922 was only $6000, and five thousand of that was paid to one vessel and one thousand to another.

The payment of claims for damages to vessels using the canal is provided for in Section 5 of the Panama Canal Act which authorized the President to make regulations governing the Panama Canal and stated in part:

"Such regulations shall provide for prompt adjustment by agreement and immediate payment of claims for damages which may arise from injury to vessels, cargo, or passengers from the passing of vessels through the locks under the control of those operating them under such rules and regulations. In case of disagreement suit may be brought in the district courts of the Canal Zone against the Governor of the Panama Canal. The hearing and disposition of such cases shall be expedited and the judgment shall be paid immediately



Canal salvage vessel taking care of a case of stranding.

out of any moneys appropriated or allotted for canal operation."

The fact that since the beginning of operation of the canal August 1, 1914, to the present date, not a single suit has been brought against the governor for such damages, indicates that the administration of the canal is as careful and efficient as the operation.

Curious Cargoes

Some curious items are found among the millions of tons of cargo from all parts of the world that pass through the Panama Canal in a year. Taken at random from the records, they remind one of John Masefield's poem, "Cargoes," in which we read of the Quinquireme of Nineveh—

"Rowing home to haven in sunny Palestine,
With a cargo of ivory,
And apes and peacocks,
Sandalwood, cedarwood, and sweet white wine."

One of the sweetest cargoes that ever passed through the canal was that of the tank-ship Paul Shoup with 6000 tons of molasses. Another ship from Chile carried two cases of ambergris weighing about 100 pounds and valued at $17,000, and seven barrels of teeth from the sperm whale that produces the ambergris. As the sperm whale has teeth only on its lower jaw, it must have taken a goodly number to produce seven barrels. The ambergris is a secretion from the alimentary canal of the sperm whale, and is sometimes found floating or on the beaches in the tropics. It is of the consistency of wax and is white, ash gray, yellow or black—often a combination of colors is found in a single mass. It is highly valuable in the manufacture of perfume.

It seems proper that the Deerfield should have in its cargo fifty-five tons of frozen reindeer meat. In the cargo of the Felix Taussig were forty-seven bales of goats' beards weighing 23,127 pounds, twenty-one bales of human hair weighing 10,497 pounds, and a large consignment of pig bristles. It makes one think of "Barber, barber, shave a pig—how many hairs to make a wig?" Two other items in the same cargo are more to one's taste. They were 633 tons of strawberries and four tons of pheasants in cold storage.

The Babinda from Rio Janiero to San Francisco had an entire cargo of bones and the Scotia Maiden from "The Mystic Isles of the South Seas" brought 1728 barrels of cocoanut oil. Eggs, fresh, frozen and dried, aggregating 3448 tons, made up the greater part of the cargo of the Gothic Star, and the Tuscan Star of the same line carried 6200 tons of frozen eggs from Hankow, Nanking, Shanghai, and other Chinese ports. There is probably a reason for the fact that the Kennecott carried 350 tons of dried raisins from San Francisco to New York, and it is natural that the Chipchung from Japan should have 450 tons of chrysanthemum seeds.

The British steamship Jamaica, which holds record for largest number of Panama Canal transits. She has made 257 transits of the Panama Canal since November 5, 1914, and has paid in tolls almost $200,000.

NEW DREDGING EQUIPMENT FOR CANAL

An electrically driven floating relay booster plant, designed for use in connection with pipe-line suction dredges for lifting spoil to higher levels or depositing at greater distances than is possible with the dredge alone, was placed in service in Gaillard Cut on March 31, 1924, and has been in use since that date. This plant consists of two 20-inch centrifugal pumps, one of 750 and the other of 550 horsepower, installed in the hull of the old sand and rock barge No. 3. The pumps are so arranged that one discharges into the suction of the other, thus obtaining the properties of a 2-stage pump, or the second may be by-passed when desired for use on shorter or less elevated pipe lines. The plant is portable, contains necessary auxiliary pumps for water service, transformers for stepping down transmission line potential of 11,000 volts to 2200 volts for operating and may be used at any point where 3-phase power at 11,000 or 2200 volts is available.

Connection between the dredge and relay pump is effected by means of pontoon pipe and and a pontoon of special design is provided adjoining the intake of the first pump, by means of which, through the agency of two 20-inch flap valves installed in a submerged side outlet, and which are normally closed, the first relay pump will automatically take water whenever for any reason the dredge fails to supply material under pressure. This feature is particularly desirable for preventing pipe-line plugs, as the line may be cleared with water even though the dredge shuts down without notice.

The plant was in successful operation throughout the month of April, 1924, part of the month relaying material a distance of 9739 feet and over a maximum elevation of 61 feet. The total length of line from dredge to outfall was 10,761 feet or over 2 miles. The indications are that the plant can be expected to handle material efficiently to elevations of over 250 feet through short lines (under 1500 feet), or through a total pipe-line length of about 3 miles for low lifts (under 20 feet).

The cost of handling Cut maintenance material with this plant is less than 50 per cent of the cost of handling the same class of material with dipper dredges. Delays to operation chargeable to the relay barge in April were only 24 per cent of the total delays to the entire plant.

The engineers of the Canal Zone take a refreshing pride in maintaining economy and efficiency in the operation of the Big Ditch.

MARINE OIL ENGINE
AND MOTORSHIP PROGRESS

MOTOR ROOM EQUIPMENT

Some Practical Comment on the Propulsion and Auxiliary Machinery of Modern Motorships from a Marine Engineer's Point of View

IT is hoped that the following suggestions which occurred to the writer while in charge of the machinery of a large motorship may prove helpful to those who are concerned with the layout of a new plant. Unfortunately, too great an amount of secrecy and a certain amount of mystery surrounds the marine diesel engine, and it is felt that a freer interchange of information should be encouraged.

A vast amount of thought has been expended on the design of large marine engines, and the result of this is seen in the successful running of the present day motorship, in which the reliability of the main engines has somewhat eclipsed that of the auxiliaries, upon which, after all, the main engines are usually dependent for cooling water and lubricating oil.

The points of superiority of the four-stroke and the two-stroke are still being argued upon by the advocates of the two types, and need not be enlarged upon here. It is sufficient to state that good and reliable engines of both types are being turned out. Blast versus mechanical injection of fuel is also a very knotty problem. Blast injection is certainly a very handy method of obtaining smokeless combustion at full speed, and on the other hand mechanical injection simplifies matters by eliminating the air compressor and permitting of lower compression pressures and lower minimum speeds when maneuvering.

A combination of the two systems might be an advantage, blast air to assist in pulverization and turbulence at full speed, and mechanical injection to be used at slow speeds while maneuvering, when the surplus air could with advantage be passed to the starting air tanks. The difficulty of maintaining regular combustion at very low speeds is due to the cooling effect of the blast air, and if the pressure of this is allowed to fall too low, fouling of the pulverizer is sure to occur.

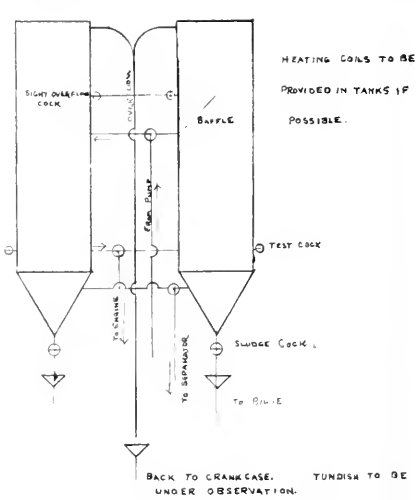
Fresh water cooling of both jackets and pistons would be a decided step in the right direction. In the jackets, very much less scale would accumulate, particularly in the somewhat badly circulated cylinder head water packet spaces of some four-stroke cycle engines. If pockets of badly circulated salt water are allowed to form, scale is bound to occur. The scale in turn interferes with the cooling function where it is most urgently required. Also, the employment of fresh water cooling for everything except thrust guides and compressors, which should be run as cool as possible, would permit of a very handy system of heating up before starting. If this could be effected, fewer cracked cylinder heads would be met with, the engines would start much easier, and the time and labor required for cleaning cylinder head water jackets would be much reduced. The heat of the jacket water from the auxiliary generator engines, which would also be fresh water cooled, would be quite sufficient for this purpose.

Salt piston cooling is not satisfactory, because even if there is no actual leakage of splashing, there is always a salt atmosphere round about the piston cooling pipes, and this is carried up into the cylinder and gets on to the cylinder walls. The effect of salt upon lubrication is too well known to need enlarging upon. In the writer's experience, cylinders have always worn to a larger diameter in a thwartship direction owing to the position of the piston cooling pipes. Owing to the agitation of the water in a rapidly reciprocating piston, no badly circulated pockets can form, and in practice, although the piston cooling discharge is very much hotter than the jacket discharge, very little scale is found in the pistons.

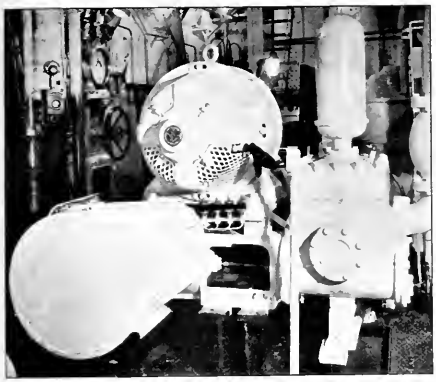
In piston cooling gear of the telescopic tube type, the provision of a flexible connection between the moving telescopic pipe and the piston, or some equivalent means of allowing for slight changes of alignment, would save a lot of unnecessary wear.

Iron jet pipes are not satisfactory on account of the rapid corrosion that takes place. Wear and corrosion, however, would both be lessened by the use of fresh water. The salt water cooled diesel engine of today may be compared with the early jet condensing steam engine.

The lubrication system requires special attention. The reserve oil may be carried in the double bottom



Sketch showing arrangement of gravity tanks for clearing sediment from lubricating oil.



Worthington 8½-inch by 12-inch horizontal duplex dump on cooling water system of the American motorship Challenger. The motor is a 20-horsepower Westinghouse.

if no other suitable place can be found for it, but on no account must the double bottom act as a drain tank, on account of the difficulty of cleaning out the sediment. Sediment can best be got rid of by the employment of two long cylindrical gravity tanks with cone bottoms, oil in one tank to be in circulation while the oil in the other is settling. Steam heating of these would be a great help, if available. These tanks should be of generous capacity and capable of holding all the oil that is required to be in circulation, so that all the oil could be pumped to them in port.

No sheet iron pans should be used under the engines where these are set on built-up stools, as the latter could easily be made oil-tight when being built, and could serve to collect the oil that drains down from the engines. There should be a sump let into the tank top at the after end of the engines, from which the lubricating oil pumps could draw direct through a suction filter. In a twin screw installation the space between the engines could with advantage be made to serve as a lubricating oil reserve tank, but the top would have to be a little below the level of the top of the engine seating, so that the holding down bolts would be accessible without going inside the tank. A centrifugal oil separator is usually fitted in a motorship and is a very useful fitting, but is usually of too low a capacity. However, if the dirty oil passes through a settling tank before being fed to the separator, the latter does not require cleaning so frequently, and can consequently deal with a much larger quantity of oil.

Pistons and rings have given some trouble in the past, but this has been practically overcome.

It is needless to add, with regard to the main engines, that anything that makes for reduction of the number of parts and consequent simplification is a step in the right direction, as more refinements in the matter of adjustments can be carried out without keeping the ship in port after the cargo is finished.

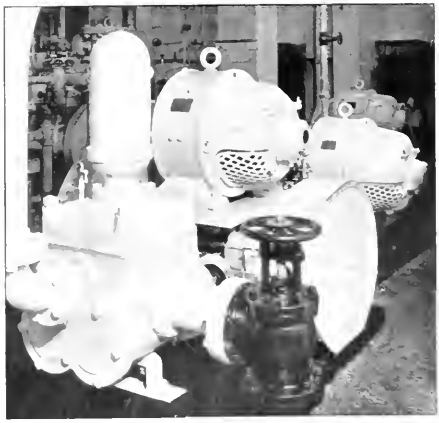
Auxiliaries

Auxiliary engines for generating sets could be written about at length, and, as has already been hinted, in the past, these have in some cases required more overhauling than the main engines. Even more than in the main engines, simplification as well as a reduction in the number of revolutions here is needed.

The ideal auxiliary engine would be a fairly moderate speed, two-stroke, solid-injection engine of the crosshead type, with the crankcase entirely separate from the working cylinders and the under side of the pistons to serve as a scavenging pump. Such engines are actually being turned out with forced lubrication and oil-cooled pistons in the larger sizes. In the past the trunk piston engine has been inclined to be somewhat extravagant in the use of lubricating oil, and particles of carbon have caused bearing trouble in some cases on account of the contamination of the oil. Many makers claim to have successfully overcome these defects and to thus turn out a very cheap engine for the smaller powers. Hard phosphor bronze bushes appear to give better service at the gudgeon pins than babbitt does, on account of the latter having a tendency to get pounded out by the high bearing pressures which are inevitable owing to the limited area of gudgeon pin available. In a four-stroke engine the knocking due to inertia of the piston on the suction and exhaust strokes can be very considerable if the gudgeon bearing is allowed to become slack. Slackness at this point also allows of the escape from the bearing of an undue amount of lubricating oil, which finds its way on to the under side of the piston crown, there to be formed into carbon.

Solid injection permits of the use of lower compression pressures, thus reducing the load on the bearings. Auxiliary engines should start with the same starting air pressure as the main engines, as low pressure starting has a very much less cooling effect on the cylinders. At least three auxiliary generating sets should be provided, so that one can be running at sea, one in the "ready" position, and one under overhaul if necessary. A small generating set to run lights and one or two pumps in port would be a paying proposition on account of the reduced wear and tear on the larger machines. Two of the generator engines should be

(Continued on Page 46, Advertising Section)

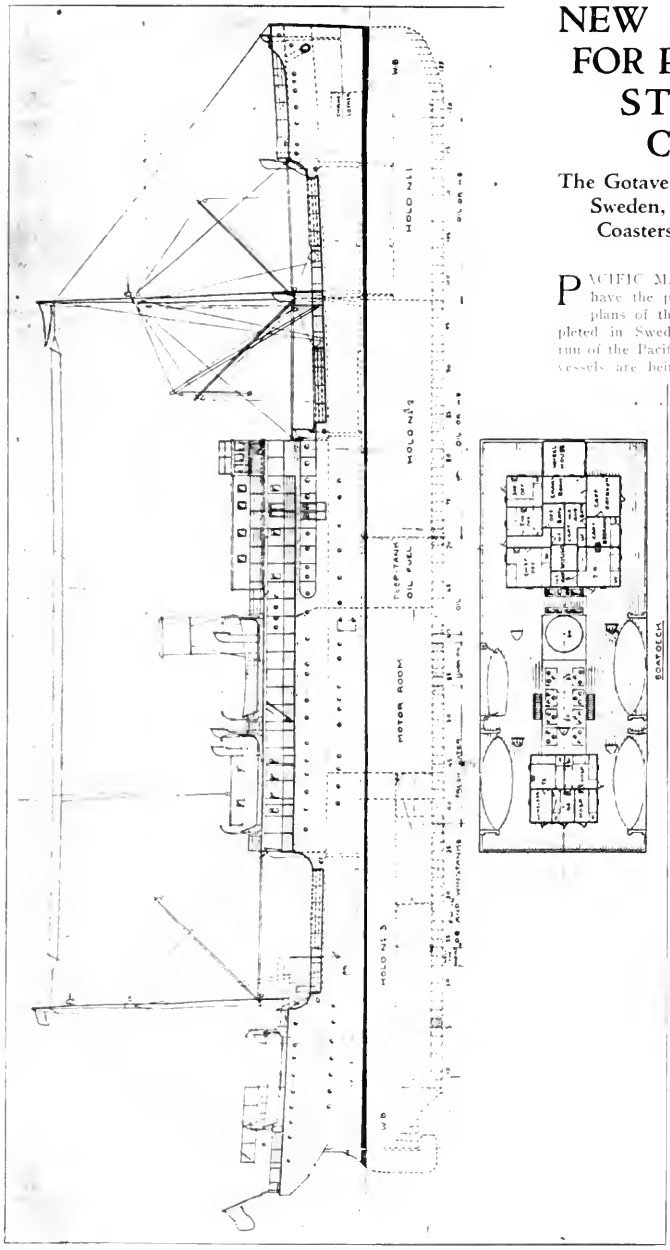


Three Westinghouse motors driving auxiliary engine room pumps on the American motorship Challenger. The pumps are all Worthington and handle the engine room bilge, fresh water for the ship's use, and salt water for the ship's sanitary system.

NEW MOTORSHIPS FOR PACIFIC MAIL STEAMSHIP COMPANY

The Gotaverken Yard of Gothenberg, Sweden, Building a Pair of Small Coasters for the San Francisco-Panama Run

PACIFIC MARINE REVIEW is very glad to have the privilege of publishing herewith the plans of the new motorships now being completed in Sweden for the San Francisco-Panama run of the Pacific Mail Steamship Company. These vessels are being built by the Aktiebolaget Gotaverken of Gothenberg, Sweden, to Lloyds' 100 A-1 classification for 1923. The equipment and the construction will also comply with the rules of the United States Steamboat Inspection Service as applied to vessels carrying passengers in and out of United States ports. The new vessels are to be named the City of San Francisco and the City of Panama. The former will have her acceptance trial on July 15 and the latter about the middle of September.



The principal characteristics of the hulls will be:

Length over all	313 ft. 0 in.
Length between perpendiculars	300 ft. 0 in.
Beam molded	45 ft. 9 in.
Depth molded to shelter deck	30 ft. 0 in.
Displacement coefficient at mean draft	0.71
Deadweight tonnage at mean draft	2900
Mean draft	20 ft.

Passenger Accommodations

As will be seen from plans herewith, the new motorships are to be of the three-island type with the first-class accommodations located in the amidships superstructure on the shelter and bridge decks. These accommodations will take care of thirty first-cabin passengers. Four cabins de luxe have been installed with individual baths. Steerage accommodations for sixty passengers are installed on the shelter deck aft and on the main deck. Thorough ventilation of all passenger accommodations, complete sanitary equipment, and all modern conveniences will be installed to make these vessels in every way comfortable in the tropics.

Machinery

Each of the motorships will be propelled by twin screws driven by 6 cylinder, 4 cycle, crosshead type, single acting, directly re-

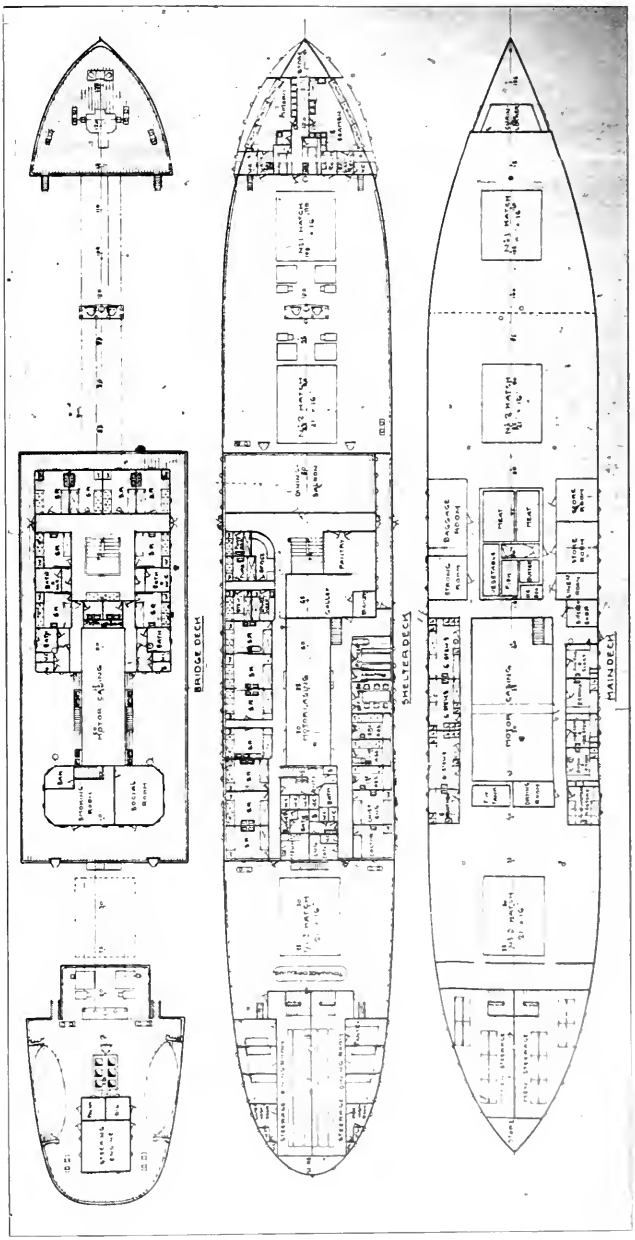
versible Burmeister & Wain diesel engines. These engines are figured to produce 1300 indicated horsepower each at 130 revolutions per minute and to propel the hull at guaranteed sea speed of 12 knots per hour. Gotaverken guarantee a fuel consumption not to exceed 9 tons a day at 12 knots an hour, and a fuel consumption not to exceed 6 tons a day at 10 knots an hour. This guarantee involves 0.33 pounds of fuel per indicated horsepower hour at 12 knots speed, and all guarantees are made for the loaded condition of 2900 tons deadweight of cargo in the holds.

Auxiliary Machinery

All auxiliary machinery will be electrically driven throughout. Electric power for this purpose will be supplied by three sets of 2 cylinder, 4 cycle, single acting diesel engines, each directly connected to a 50 kilowatt generator. Ample electric deck winches and cargo booms have been installed to insure prompt dispatch and quick turn-around in the handling of freight and of passengers' baggage. Ice machines and cold storage facilities have been provided to take care of all normal requirements for passengers and crew in the tropics. The galleys will be equipped with Jarvis oil-burning ranges.

These motorships will runder Panama registry and, in conjunction with two steamers now on that run, will give ample capacity in a 21-day sailing schedule. Captain C. Zastro, formerly of the Corinta, will take charge of the City of San Francisco and is on his way to Sweden for that purpose at the present writing.

With these two new fast motorships, the Pacific Mail Steamship Company will be able to give a greatly improved service to the Central American coffee ports.



EDITORIAL NOTE

We cannot refrain from calling attention here to the fact that the oldest American operating company in the steamship business apparently under the impulse of self-preservation has gone to Europe for new vessels and is to run these vessels under alien registry. No better proof could be given of the oft-repeated assertion of American shipowners that they cannot get a square deal operating in foreign trade under American law. The Pacific Mail Steamship Company has every reason in the world to have, and we are convinced the company does have, an earnest desire to operate under the American flag. Why cannot Congress make such operation more easily possible?

VARIOUS TYPES OF PROPULSION

A Comparison of the Over-all Economy of Geared Turbine, Turbo-electric, Diesel-electric, Direct Diesel, and Reciprocating Steam Engine Plants in Diverse Services

By DAVID G. TAYLOR*

IN investigating the operation of the diesel-electric ferries of the Golden Gate Ferry Company of San Francisco, it occurred to the author that a comparison of the actual fuel consumed by the different types of ferries in use on San Francisco Bay during their regular runs might be interesting. Accordingly, pains have been taken to obtain these figures from the engineer's log on the Key Route and Golden Gate ferries, and to reduce them to pounds of fuel per horsepower hour for comparison.

The Golden Gate ferries are equipped with twin 550 brake horsepower Werkspoor stationary diesel engines, each of which drives one 360 kilowatt generator and one 35 kilowatt exciter on the same shaft at 225 r. p. m. The motors are rated at 750 horsepower and 500 volts direct current, and run at speeds varying from 145 to 180 r. p. m. One motor turns the forward propeller just enough to overcome slip; the other, taking about 84 per cent of the generated power, turns the after or driving propeller. On these ferries the control of the driving motors is obtained directly from the pilot house, which minimizes danger due to mistakes in signals and loss of time in maneuvering.

The new Key Route boats, the Hayward and San Leandro, are of turbo-electric type, and do not have pilot house control. The Fernwood is one of the old type ferries with twin compound reciprocating engines.

Operation Costs

The accompanying table showing data on fuel oil consumption was taken from the log of the motorship Golden West, the lubricating oil consumption being only approximate, but very nearly correct.

SHIP	MONTH	HOURS RUN	FUEL OIL TOTAL	LUB. OIL/hr.	FUEL TONS 24 hr	FUEL LBS. MILE/hr.	LB. FUEL / LB. FUEL × MILES	LB. FUEL per H.P/hr	MACHINERY COST per B.H.P.	MACHINERY WT. per H.P.
GOLDEN WEST	OCT.	425	453 bbl.	.65 gal.	3.58	37.6	.0364	.569	$183.00	.211 TONS
" "	NOV.	489	428	.65	2.96	30.7	.0298	.472		
" "	DEC.	508	426	.65	2.84	29.4	.0286	.452		
AVERAGE OVER 3 MONTHS - OR 1422 HOURS -					3.12	32.5	.0316	.497		

Table showing average service condition on the diesel-electric plant of the ferryboat Golden West.

The data in this table were based on 2240 pounds per ton, and on 316 pounds per barrel. The whole power plant cost $137,000 installed, so the cost per brake horsepower as given above is based on this and 750 horsepower.

The crew necessary to operate the power plant consists of only three men; chief engineer, first assistant, and oiler.

While some trouble has been experienced on the Golden Gate with crankshaft and piston, the Golden West, which has been operating for over a year and has traveled about 38,000 miles, has experienced no trouble at all.

The boat makes the round trip of nine miles in about fifty minutes: forty minutes' actual running time and ten minutes' stop.

The last column in the above table was obtained from the following data supplied by the manufacturers. Only one auxiliary generator is added in to the total weight, since only one provides excitation for the main units, the other being for lighting, etc.

Weight of one diesel engine is 50 tons.

Weight of one motor (with shaft, base and bearings) is 19 tons.

Weight of one generator (without shaft, base or bearings) is 9 tons.

Weight of one exciter (without shaft, base or bearings) is 2 tons.

While the horsepower which was used to determine values of pounds fuel per hour was taken as that actually turned out by the motors (about 588 horsepower), the rated value of 750 was used to compute weight per horsepower.

Probably the best commentary on the operation of these boats is the fact that the Golden Gate Ferry Company has contracted for two new boats of similar design as the Golden West. Since they are to be larger and made of steel, they will have three diesel generating sets instead of two. These sets are to be exactly the same as on the smaller boats.

Comparison of Ferryboats

The following data were secured from the different companies represented, and are composed of averages of figures taken on regular runs over periods of time as follows: Golden Gate ferry, three months; Key Route ferry, five months; Southern Pacific ferry (since rebuilding), one year.

The table showing this data enables us to compare these different types of drives as to their fuel consumption. The fuel for the Key Route boats includes that used for standby. This amount is approximately one-eighth of the total consumption in the Fernwood, but only about 2 per cent in the case of the turbo-electric boats.

The Fernwood has been kept largely in reserve, only used in the rush hours, and this accounts for the small consumption per horsepower hour on this boat and the large consumption per ton mile.

Comparison of Different Types of Propulsion

Inasmuch as the ferryboat problem affects only a

* This article is an abstract of the thesis prepared by Mr. Taylor on completing his course in naval architecture and marine engineering at the University of California.

SHIP	OWNER	Δ TONS	USE	FUEL lbs/mile	lbs FUEL / Δ x mi.	lbs FUEL per H.P. hr.	PROPULSION
GOLDEN WEST	Golden Gate Ferry Co.	1030	Auto	32.5	.0316	.497	2-550 S.H.P. Diesel Electric
PIEDMONT	Southern Pacific Co.	1536	Pass	229.0	.149		Inclined Type Reciprocating
HAYWARD	Key Route	1653	Pass	173.3	.105	1.067	Turbo-Electric
SAN LEANDRO	Key Route	1653	Pass	191.2	.116	1.135	Turbo-Electric Double Compound
FERNWOOD	Key Route	1060	Pass	256.3	.242	1.240	Reciprocating.

Table showing comparative data of the propelling plants of different types of ferryboats on San Francisco Bay.

small part of the marine industry and offers different problems and running conditions from ordinary seagoing ships, it was thought pertinent to investigate the two types of electrical propelling machinery in seafaring ships and compare them with the other standard forms of machinery—that is, the geared turbine, direct diesel drive, and the reciprocating steam engine. For this purpose the large table on the adjoining page was prepared from data obtained on various types and sizes of ships.

In the turbo-electric class are three ships owned by the United States Shipping Board, plying between the east coast and the Orient. These were changed to electric drive as an experiment, but whatever the motive was for this change the fact remains that they are not nearly as economical as geared turbines. While the electric drive is reliable and easy to maneuver, it does not operate economically for long, steady runs. In a diesel-electric drive, however, the advantage is pronounced as compared with the turbo-electric installations; as here we use smaller high-speed engines which reduce weight and enable the vessel to maintain its schedule in case of breakdown of any one generating unit out of the four or five units used.

We have a great reduction in the number of auxiliaries in the diesel-electric drive, as compared with a turbo-electric installation; the circulating pump and the air compressor are practically the only ones necessary, and in some installations these are both driven directly off the crankshaft.

In the turbo-electric drive, besides added weight and complications, there are more factors which may affect the economy of operation. One great item is the condenser, which must be always functioning properly to get the highest vacuum possible, which makes for increased economy.

The table reproduced herewith gives the result of some tests, and was obtained from the Bridgeport Brass Company, manufacturers of condenser tubing. It is based upon a ship designed for 11.5 knots at 2500 shaft horsepower; the value of the ship at sea is $3600 per day, or $13 per knot, with an initial steam pressure of 200 pounds gauge, with 75 degrees superheat and 12 nozzles open. The following table shows that one inch of vacuum roughly amounts to from 5 to 7 per cent of fuel.

This, then, shows how very important the condenser becomes, and this is only one unit in the many-sided steam problem. An air separator must be provided to safeguard pipes, an evaporator to care for emergencies, as well as the feed pumps, injectors, hot wells, heaters, and the main turbines themselves. Then the boilers with their fuel oil pumps take much room, and the boilers must be continually scaled, inspected and kept clean.

Maintenance

While some engineers contend that the diesel engine is difficult to keep in repair, and dislike to handle them, the fact that no boiler room crew is necessary would permit such a saving that a slightly higher wage could be paid the motorship operator, if necessary. A few of the marine engineers with whom I have talked and who have had experience in operating diesel engines, contend that the motorship is a veritable workhou-e. The following tabulated data on the operation of the motorship Selene are taken from the ship's log. She is a tanker of 3738 gross tons, and 357 feet long, and was five years old when the following trip was taken, in which 50,700 miles were covered in eleven months with repairs as tabulated:

Singapore—Air compressor valves cleaned; filters cleaned.

Voyage—No trouble.

VACUUM INCHES	S.H.P.	KNOTS PER HOUR	KNOTS PER DAY	KNOTS PER YEAR 150 DAYS	LOSS IN KNOTS PER YEAR.	LOSS IN $ PER YEAR @ $13.00 PER KNOT
28	2500	11.5	276.	41,400		$ 0.00
27	2285	11.16	267.8	40,176	1,224	15,912.00
26	2120	10.88	261.1	39,168	2,232	29,016.00
25	1980	10.62	254.8	38,232	3,168	41,184.00

Table showing the importance of high vacuum on marine turbine plants.

DATA ON VARIOUS TYPES IN ACTUAL SERVICE.

NAME	OWNER	O. A. LENGTH	BEAM	DRAFT	Δ TONS DISPL	ENGINES	H.P. AV. RUN / RATED	BOILERS	TOTAL MILES RUN	AVER KNOTS	TONS FUEL per 24 hrs	LBS. FUEL per MILE	LBS. FUEL per av. H.P. Hr.	TOTAL* FUEL Δ × MILES
S.S. INDEPENDENCE	U.S.S.B	440'1½"	56'0"	28'7½"	15,942	-ELECTRIC- G.E. TURBINES	2533 / 3160	3 SCOTCH	10,353	9.69	34.94	338	1.288	.0214
S.S. VICTORIOUS	U.S.S.B	440'1½"	56'0"	28'7½"	15,942	-ELECTRIC- G.E. TURBINES	1983 / 3000	3 SCOTCH	11,034	9.42	29.30	294.6	1.458	.0261
S.S. ARCHER	U.S.S.B	440'0"	56'0"	28'7½"	15,942	-ELECTRIC- G.E. TURBINES	2632 / 3000	3 SCOTCH	10,316	9.90	33.27	311.4	1.18	.0199
USS. TENNESSEE	U.S.N	600'0"	97'5¾"	30'3"	32,300	-ELECTRIC- WES. TURBINES	20,463 / 30,229	8 B&W	TRIAL TRIP 263	19.0	33.8	144.0	1.063	.00447
S.S. CUBA	ELECTRA LINE	320'0"	40'0"	17'0"	3,580	-ELECTRIC- G.E. TURBINES	2960 / 3000	4 SCOTCH	—	16.0	34.8	177.0	1.16	.0495
S.S. McKEESPORT	U.S.S.B	395'6"	55'0"	27'1"	13,175	G.E. GEARED CURTIS TURBINE	2810 / 2500	3 SCOTCH	6391	10.77	28.62	253.0	.952	.02837
S.S. MANULANI	MATSON NAV. CO.	498'0½"	62'0"	31'5⅞"	20,714	WESTINGHOUSE GEARED TURBINE	5,500	5 SCOTCH	APPROX 14,000	12.19	46.50	308.0	.79*	.0248
S.S. MAUI	MATSON NAV. CO.	501'0"	58'0"	30'6"	17,500	WESTINGHOUSE GEARED TURBINE	9,000	8 B&W	APPROX 200,000	15.03	97.00	522.0	1.00*	.0371
S.S. MAUI †	MATSON NAV. CO.	501'0"	58'0"	30'6"	17,500	WESTINGHOUSE GEARED TURBINE	9,200 / 9,000	8 B&W	APPROX. 410	15.00	89.50	484.0	.906	.0276
S.S. MANUKAI	MATSON NAV. CO.	498'0½"	62'0"	31'5⅞"	20,714	WESTINGHOUSE GEARED TURBINE	5,500	5 SCOTCH	APPROX 14,000	12.30	51.00	336	.865*	.0256
S.S. WILHELMINA	MATSON NAV. CO.	451'0"	54'0"		12,528	4 CYL. TRIPLE 35"×58"×69"×69"	5,500	6 SCOTCH	APPROX 12,000	13.96	77.90	452	1.33*	.0366
S.S. SCOTTSBURG	U.S.S.B	419'3"	56'3"	31'2"	17,100	4 CYL. QUAD 24"×36"×51"×76"	2614 / 3350	3 SCOTCH	10,088	0.9	34.11	323.7	1.22	.0195
M/S H.T. HARPER	STANDARD OIL CO.	330'0"	46'0"	32'5¾"	7,713	-DIESEL- 2-850 HP WERKSPOOR	1700	NONE	—	9.70	7.73	64.5	.425*	.00835
M/S CHAS. WATSON	STANDARD OIL CO.	250'0"	37'0"	18'4"	3,730	-DIESEL- 2-550 HP WERKSPOOR	1100	NONE	—	9.70	5.40	45.2	.460*	.0121
M/S WM. PENN	U.S.S.B	439'6"	60'0"	28'4¾"	17,100 D.WT	-DIESEL- 2-BURMEISTER-WAIN	4291 / 5,500	NONE	10,542	11.38	13.86	113.6	.298*	.00708
M/S KENNECOTT	ALASKA S.S. CO.	360'0"	49'6"	22'0"	6,500 D.WT	-DIESEL- 2-MS INTOSH-SEYMOUR	2400	NONE	82,453	10.17	9.65	67.0	.375*	.00786 ‡
M/S ARTEMIS	ANGLO-SAXON PETROLEUM CO.	360'0"	46'6"	21'9"	5,140 D.WT.	-DIESEL- 2-900 HP. WERKSPOOR	1800	NONE	6,000	9.6	6.90	58.5	.358	.00790 ‡
M/S STANDARD SERVICE	STANDARD OIL CO.	210'0"	40'0"	15'0"	2735	DIESEL-ELECTRIC 2-400 HP WERKSPOORS 1-600 HP MOTOR	600	NONE	—	9.05	3.40	30.3	.530*	.0111

† DATA TAKEN ON REGULAR RUN OVER 23.76 HOURS.

* COMPUTED ON RATED H.P. ~ AVERAGE BEING UNAVAILABLE.

‡ DISPLACEMENT USED WAS COMPUTED. BLOCK COEFFICIENT ASSUMED .76

Table prepared by the author from service data obtained from the logs of sea-going vessels of various types of propulsive machinery.

Australia—Air compressor valves ground; cool water pumps overhauled.

Voyage—One motor stopped; three-quarter hour to renew joint, exhaust valve box.

Balik Papan—Exhaust valves disassembled and ground.

Voyage—No trouble.

Singapore—Fuel rollers adjusted; valves and telescope piping inspected.

Voyage—No trouble.

Bordeaux—Cleaned fuel air filters; air compressor valves changed; lubrication inspected; compressor pistons opened; new rings and grooves trued; all crosshead, crank bearing and main shaft bearings fitted; fuel valve needles repacked.

Voyage—One motor stopped for 1¾ hours for air compressor; other motor stopped 2 hours for changing exhaust valve.

Port Said—No repairs.

Voyage—No trouble.

Abadon—The suction and delivery valves, air compressors, main and auxiliary motors opened and cleaned; 2 exhaust valves changed; oil filters cleaned.

The Selene then sailed for Singapore by way of Colombo. She went on drydock in Singapore for her periodical inspection. During the overhaul the following points were noticed: All bearings and crank-pins were in good condition. Starboard shaft worn down .7 m.m. over all bearings. Port shaft worn down 1 m.m., .8 m.m. and .6 m.m. in three different bearings. All bearings and crank-pin brasses were adjusted. Two pistons were examined and found to be in good condition, so none of the others were inspected. Some fuel needle valves were repacked, two piston bolts removed, water pump straps secured.

The voyage then continued as follows:

Voyage—Both motors stopped for ¾ hour for examination at crankshaft; both motors stopped for ½ hour to examine bottom ends; one motor again stopped for 3 hours for broken slipper guide bolt.

Suez—L. P. and I. P. air compressor rings renewed; valves cleaned, also fuel filters, compressors and mudboxes.

Voyage—One motor stopped for ½ hour for tightening piston bolts; also again for 2 hours to renew two broken piston bolts.

Hull—No repairs necessary.

While during the eleven months' voyage the engines were stopped eight times, only three of these stops were serious or absolutely necessary. The remaining stops might have been avoided by simply cutting out one cylinder, if it had been absolutely necessary to keep the engine running. If these repairs are carefully checked as a whole, however, they are found to be very small and inexpensive compared with those necessary in a steam vessel after going 50,000 miles. Extensive boiler refitting would be necessary, besides frequent scaling during the voyage. And the repairs are, as a whole, easier to make, as the unit is smaller and lighter than a steam engine. In the latter, the changing of a piston means a hot, tedious job on top of the cylinders, unscrewing fifteen or more large bolts and then breaking the head loose, etc. Anyone who has worked upon reciprocating steam engines, as the author has, will testify to this fact. So I believe that we may conclude that the diesel engine is reasonably free from costly repairs, a fact sometimes doubted, and from inquiry among some operators of diesel-driven ships, I believe the operation of the Selene is representative.

Weight of Machinery

To compare the weights of the diesel engine with the steam, the following data were taken on two Standard Oil tankers:

	S. S. El Segundo	M. S. W. T. Harper
Loaded displacement	7,586 tons	7,713 tons
Light displacement	2,604 tons	3,016 tons
Cargo capacity of holds	222,132 cu. ft. (oil)	228,250 cu. ft. (oil)
	7,826 cu. ft. (dry)	26,672 cu. ft. (dry)
Total	229,958 cu. ft.	254,922 cu. ft.
Carrying capacity (with 30 days' fuel supply on 22½ draft)	27,000 bbls.	29,100 bbls.
Weight of complete engine—room machinery, propeller and shaft	390 long tons	330 long tons
Length over all	343 ft. 4 in.	342 ft. 0 in.
Breadth M. D.	46 ft. 0 in.	46 ft. 0 in.
Depth M. D. to spar-deck	27 ft. 0 in.	26 ft. 11¾ in.
Loaded draft (mean)	22 ft. 5½ in.	22 ft. 5¾ in.
Cruising radius	7300 nau. mi.	20,000 nau. mi.
Deadweight capacity (cargo oil, fuel oil and F. W.)	1982 tons	4697 tons
Designed shaft horsepower	1650	1700
Rated I. H. P. of main engines	1900	2260
Engine speed	91-95 r. p. m.	135 r. p. m.
Designed loaded speed	10 knots	12 knots
Daily fuel consumption (24 hours)	23-24½ tons	7½ tons
Propellers	1-15′ dia. x 13′ pitch	2-11′ dia. x 10′ pitch

This, then, shows that while the two above vessels are as nearly alike as possible, their carrying capacity is very different, as is their fuel consumption.

The motorship is several tons heavier than the steamer, but this is not due to the diesel machinery, as the two main engines only weigh 220 tons together, compared with 300 tons for the steam-engine and boilers of the El Segundo. The motorship, however, has 2100 barrels more carrying capacity than the steamer, although the deadweight of the El Segundo is larger. For this reason the cost of a vessel should never be expressed as so much per deadweight ton, since the carrying capacity is its true measure of worth. As can be seen, the motorship carries more cargo on one-third the amount of fuel oil.

The engine room on the motorship is 60 feet long, while engine room, boiler room and deep tank combines on the steamer measure 86 feet long, or 26 feet

longer. This, then, amounts to about 24,964 cubic feet gain on the motorship.

We may also see how a geared turbine installation compares with the diesel and steam reciprocating jobs as to weight, by taking the data following from some of the 5350 deadweight ton cargo boats built by the Submarine Boat Corporation during the closing days of the war. Westinghouse equipment was used throughout with the main dimensions and weights as follows:

Length over all	335′ 6″
Beam molded	46′ 0″
Draft loaded	22′ 11″
Displacement loaded, tons	7,615
Designed speed, knots	10½
Shaft horsepower	1,500
Cubic capacity, cubic feet	269,600
Fuel oil capacity, tons	653
Main turbine, pounds	19,500
Main reduction gear, pounds	43,070
Strainer and three valves, pounds	1,750
Main condenser, pounds	20,000
Auxiliary condenser, pounds	7,250
Pumps and ejectors, pounds	6,785
Shaft, bearings and stern tube, pounds	54,800
Boilers (wet) and superheaters, pounds	105,700
Total weight, pounds	258,855

Then the total weight of the engine and boiler room machinery, shaft (excluding propeller) is 116 long tons. We see that for our motorship, deducting 10 tons as the approximate weight of the propellers, we get a weight of engine room machinery and the shaft of 320 long tons. This shows the diesel installation to weigh just about three times as much as a geared turbine drive. Space, however, is saved by the motorship's installation.

It would then appear from these comparisons that: 1—The reciprocating engine drive is the heaviest and uses most fuel. 2—The diesel drive requires least space, is slightly lighter than the reciprocating job, and is by far the most economical installation possible as to fuel. 3—The geared turbine is the lightest of the three installations, and uses much less fuel than the reciprocating engine. The space occupied for the turbine is about the same as the reciprocating plant.

An important factor, then, in deciding between diesel or turbine drive is whether space saving or weight (tonnage) saving is most desirable. The kind of cargo to be carried will partly determine this factor.

TRANS-PACIFIC SIDE WHEELERS

(Continued from Page 353)

ever the winds favored, and on the home run up the northern route the Colorado had plenty and to spare, for she got into a gale that shook things up badly.

Being originally built for the tropical and quiet run to Panama, the rigors of the North Pacific were rough on her, but by reason of the good seamanship of her officers and crew, she came through all right, but did not make another voyage. She was followed by the America, built by the Pacific Mail Steamship Company for the Oriental trade, and she in turn was supplemented by the Japan, Republic and China, all of which are now gone the way of old ships. The America was burned in Yokohama harbor, and Mr. Worsdale was at that time a member of her crew. He was also on the steamship San Francisco, wrecked on Rajah Shoals off the coast of Mexico.

So it is to be seen that Mr. Worsdale's life has been quite an eventful one, he having passed over a half century at sea, and forty years of this in one company.

THE CONVERSION OF STEAMSHIPS TO MOTORSHIPS

By EDWARD G. TUCK, Chief Surveyor

As there may be a number of conversions of steamers to motor vessels, if the bill now pending in Congress becomes a law, it will be interesting to note the following facts regarding the principal necessary changes to hull and machinery to meet the classification requirements of the bureau.

Regarding the hull, the double bottom ballast tanks and the peak tanks may be used to carry oil fuel without structural change, except where the height of the overflow is increased to meet the requirements for oil tanks, to such an extent that the tanks will not satisfactorily withstand a test head to that height, in which case some additional structural strength will be necessary. Ceiling or dunnage on tank tops and bulkheads in cargo spaces is necessary to prevent possible oil seepage, or fumes from same from coming in contact with the cargo. Some additional pumping arrangements will have to be provided to satisfy classification requirements and the machinery foundations will have to be replaced by foundations suitable for the new machinery. It will probably be desirable to remove some bunker and fireroom bulkheads, or so reconstruct them as to secure satisfactory structural efficiency of the hull in that vicinity. Rearrangement of the pillars and girders in the machinery space and the providing of settling tanks may also be necessary.

In connection with the main engines it may be found advisable to retain the old line and propeller shafts, since by so doing no change in stern tube and stern frame will be necessary. An idea of the power and size of main oil engines that will be suitable for the different sizes of shafts at present in the ships may be obtained from the following examples and formula, to-wit:

At 2800 I. H. P. standard reciprocating steam engine running at 90 r. p. m. requires a 13⅛-inch line shaft and a 15¼-inch propeller shaft; these shafts will be suitable for either a two or four-cycle oil engine of about 2550 S. H. P. running at 100 r. p. m.

A 1400 I. H. P. standard reciprocating steam engine running at 100 r. p. m. requires a 10-inch line shaft and a 12-inch propeller shaft; these shafts will be suitable for an oil engine of about 1300 S. H. P. running at 115 r. p. m.

A 2500 S. H. P. steam turbine geared to turn the line shaft 90 R. P. M. requires a 12¼-inch line shaft and a 13½-inch propeller shaft; these shafts will be suitable for an oil engine of about 2500 S. H. P. running at about 120 r. p. m.

The shaft or brake horsepower of oil engines suitable for other sizes of shafts may be approximated from the following formula:

$$\text{S. H. P.} = \frac{d \times \text{R. P. M.}}{88},$$

where "d" equals the diameter of the line shaft in inches, and assuming that the oil engines are fitted with sufficient fly-wheel effect to keep the engine speed fluctuation down to about 3 per cent above the mean speed.

It will be noted from the foregoing that ships now fitted with steam engines can be readily converted into motorships of approximately the same speed and power without any change being made in the line and propeller shafts.—(American Bureau of Shipping Bulletin.)

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

THE USE OF PAINT AT SEA

An Analysis Prepared by an Expert Showing the Types of Paint Best Adapted for the Various Portions of the Hull and the Best Methods of Applying Same

THE preservation of steel vessels is a science in itself. A steel plate is subject to corrosion by many causes; in the first place, dampness and salt water tend to destroy it; secondly, electrolysis by contact with other metals or even between steel plates of various qualities is a further cause of such destruction; thirdly, many cargoes, such as sulphur, sugar and even crude petroleum, cause destruction of ships—sulphur by depositing weak solutions of sulphuric acid, sugar by the acids of fermentation, and crude oil by sulphur which is contained in certain qualities and which while at sea, combines with bilge water and forms a weak sulphuric acid solution, causing heavy destruction in the bottom of the vessel where it settles by gravitation.

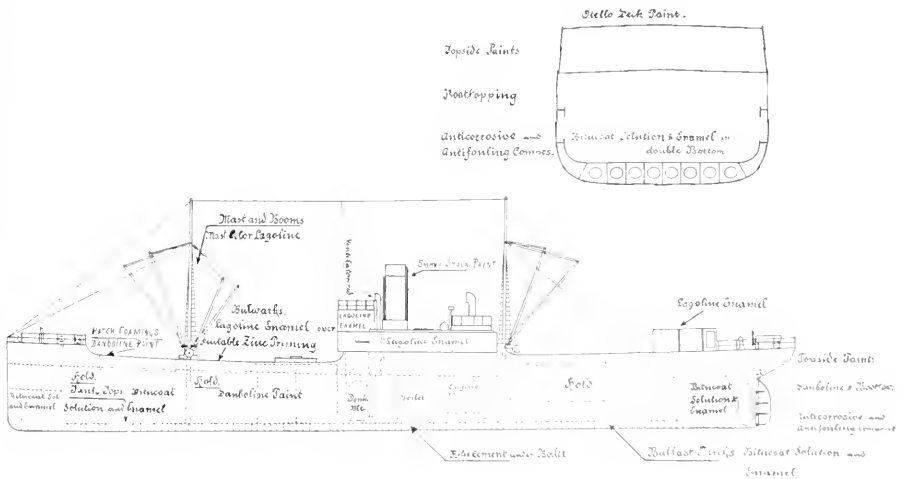
So far, the best known and practically the only defense against these destructive agencies is paint, but paint is a "dark horse." The principal question is, **Which paint?** There are good paints and poor paints; sometimes an expensive paint is no good for a certain purpose, while an inexpensive paint would fill the bill. Discrimination in this matter does not exist to any large extent either in American government departments or by shipowners.

Paint Specifications

Certain paint specifications have been devised by the Bureau of Standards. When they were so devised, the Bureau of Standards had in view the use of such paints on houses, railroads, industrial plants, etc., but it is hardly to be supposed that they took shipping into consideration, because at that time American overseas shipping was almost non-existent. Still, government departments order all their paints to be manufactured according to the schedules of the Bureau of Standards, not only the Navy Department, but also the Emergency Fleet Corporation, which was intended to be something of a commercial institution. The paints ordered by the Navy Department and by the Shipping Board are all made according to the Bureau of Standards specification.

Private shipowners, however, order their paint by getting competitive offers from various firms and frequently accepting the lowest price. The captains or marine superintendents, in specifying for these paints, are still largely influenced by the practice existing at the time of wooden vessels, when ordinary oil paints were undoubtedly quite suitable for the purpose for which they were used. The fact that steel vessels have since come into use and require an entirely different treatment has not fully dawned on the consciousness of the shipowning public.

Coming now to the question of what improvement may be brought about in this connection, I would like in the first place to refer to the use of red lead, which is still largely employed in connection with shipping. Tests made by the American Society for Testing Materials some ten years ago proved that red lead was superior to practically all other plants which were tried



Profile and section of a typical freighter, showing suggestions for proper application of paint.

at the time as a preservative on a bridge belonging to the Pennsylvania Railroad. This fact became known to the principal engineers and was accepted by them as a final proof of the superiority of red lead for the preservation of steel. While red lead is no doubt a good preservative under certain conditions, it certainly is not the best preservative in connection with shipping, but there are other paints, less expensive and more suitable, which could be substituted.

Bottom Paints

Coming first to the outer surfaces and starting with the outer bottom of the ship, the practice of painting ships on the stocks before the millscale has been removed unfortunately continues. The result is that many ships, after being five to ten years afloat, have to have their bottoms scaled. In such cases frequently one or two coats of red lead are applied, and over it, immediately afterwards, anticorrosive and antifouling compositions. In that case the red lead is generally softened by the composition and worn off by surface friction. A Norwegian tank steamer was recently in drydock in New York. She had her bottom scaled in Baltimore three months before, and two coats of red lead were applied to it, and over it two coats of composition. The captain soon after found that the whole of the paint had fallen off and the ship had to dock again in New York, within three months of her previous docking, when he applied quick-drying compositions only.

The Navy Department applies red lead to the bottoms of ships only when a ship remains in drydock six weeks or more, because it is considered necessary that red lead should be thoroughly dry before anticorrosive and antifouling paints can be applied over it. On the other hand, an oil paint is desirable as a first cost on steel after it has been scaled. For this purpose a high-class oxide of iron paint made with a mixture of linseed and Chinawood oil should be used. This will dry quite hard within twenty-four hours, enabling the application of anticorrosive and antifouling paints over it with satisfactory results. Such a paint is sold under the name of "Danboline" by the International Compositions Company, Inc., New York, and their agents.

The Boottop

As regards the boottop, it is unfortunately a fact that shipowners do not realize the necessity of better preservation of this portion of the vessel, which not only is exposed to the alternation of air and seawater, but which is also frequently chafed against quay-walls, and by lighters, anchor chains, etc. As a result the boottop portion of the ship has frequently to be scaled, because with the treatment it has so far been getting in this country a heavy scale is continually forming.

In order to get a properly preserved boottop, it is necessary to remove all scale and rust and then to apply a first-class oil paint. Here again the combination of linseed and Chinawood oil is to be recommended, and this can be obtained in "Danboline" paint. Over it one or two coats of the usual boottop paint should be applied. This should be renewed at frequent intervals, and particularly when a vessel has discharged at a foreign port, some men in a boat should be sent out to touch up the places which have been chafed. This is done much more frequently by foreign ships than by American ships. Unfortunately under the guidance of their labor leaders, American seamen are rather indisposed to undertake any of this work. It is to be hoped that they will realize the desirability of cooperating with their owners in these bad times to preserve the valuable property of our vessels.

Topsides

The next portion of a ship is the topsides from the deep-loadline to the rail. This section is generally painted black. For this purpose an oil paint is mostly used. There are also quick-drying paints sold in England under the name of "Corroline" and in the United States under the name of "Otello." In buying paints for this purpose, the shipowner generally limits the cost of the paint; as a result, it does not last very long and has to be frequently renewed. There are, however, high-class paints made, which will last six to twelve months. Before the war the Austrian Lloyd used such paints, which were made by the firm of Zonce of Trieste. Black "Lagoline" paint would also give lasting results.

Superstructures

Coming now to the deck, there are the bulwarks, and deck houses which need protection. On most ships, ordinary oil paint is still applied, and this is bought in competition at low prices and is considerably adulterated. There are, however, superior oil paints manufactured which are made with what is called "high boiled oil." In preparing this paint the oil is heated to about 390 to 400 degrees centigrade, when it turns very thick and obtains many of the characteristics of rubber. It has then to be thinned down with turpentine or petroleum spirit and mixed with suitable pigments. Paints made by this process are washable; they are not destroyed by the alkalies contained in soap. Scandinavian captains, who have been using this class of paint for many years, under the name of "Lagoline", which is manufactured by the International Compositions Company, find that they have not to be renewed more than at most once a year, and that they keep their gloss and good appearance throughout that period, while ordinary oil paints after one or two washings lose their gloss and are gradually washed away.

Coming now to the question of protecting steel decks, many disappointing trials have been made. The best results can be obtained with bituminous solutions, or if the black color is objected to on account of absorbing too much heat, red Otello paint can be used for the purpose. These paints are hard; they last a long time and are inexpensive.

Interiors

As regards the protection of the inner portions of the vessel, starting from the ballast tanks upwards, it has been customary to apply here bituminous solutions and enamels. These have given very good results, particularly where the enamel was also used. The enamel is applied hot, and can hardly be conveniently applied by the crew, but two or three coats of solution would last several years, and they give a thorough protection if they are applied to the true surface of the steel, or over a good sound surface of bituminous solution previously applied. These solutions are sold under the name of "Bitucoat", "Hermastic", "Bitumastic", "Biturine", etc., and can be obtained in practically all ports.

The coal bunkers are also best protected by these solutions, as they are in a large measure proof against electrolysis. Electrolytic currents are set up between coal dust and the ships' plates, and thereby corrosion is increased. Bituminous solutions, however, prevent this, while ordinary paint does not.

Coming next to the holds, bulkheads, and under por-

(Continued on Page 41, Advertising Section)

METAL FURNITURE FOR SHIPBOARD

The Simmons Company Develops a Standardized Line of Steel Furniture Peculiarly Adapted for use in Staterooms Aboard Ship

AN interesting development during the past year is the production of metal furniture for use in sleeping rooms.

Metal has been used for many years in the construction of office furniture, such as desks and filing cabinets, and for the universally known metal bedstead and a few special adaptations of built-in furniture; but only recently was it found possible to produce furniture of the same material for the more intimate use of the individual. Ingenious methods of construction reduce the weight to a point but slightly in excess of wood for relative cubic contents, at the same time providing furniture beautiful in design, harmonious in finish, and generally pleasing in appearance.

Frame of vanity dresser assembled ready for finishing.

The use of steel produces furniture which is not only durable and lasting, but is extremely satisfactory in service, because of the elimination of the objectionable features that are inherently present in wood products. The cases are assembled in jigs and permanently anchored at each contact point by acetylene welding. This means that the cases cannot be jarred or twisted out of true, and as neither climatic changes, humidity or artificial heat can expand, contract, or warp the material the permanently easy operation of doors and drawers is assured, as is also the rigidity of the locked and welded joints. Mirror standards cannot work loose in their anchorages, and mirrors do not crack because of swelling or shrinking of frames.

High Heat Finish

The finish is produced by a high heat process and is so hard it is not affected by heat, alcohol, or toilet preparations. Even a forgotten cigar or cigarette can burn itself out without leaving a scar behind. Paradoxical as it may seem, the finish, while so hard as to be flint-like, is so flexible that a panel may be bent double and straightened out without cracking the surface. This particularly prevents the cracking and flaking which frequently occurs under expansion and contraction.

Not only is this furniture non-absorbent to liquid or odors, but no rodent can gnaw its way into drawers, which are so accurately made they are measurably moth proof. Humidity is extremely destructive to wood furniture, but has no effect on this product. Furthermore, steel furniture is absolutely non-combustible.

Under certain circumstances rooms may be so equipped that the only burnable material in them would be the bedding or floor covering. In many small fires valuables and even clothing would be substantially protected. A dresser or chest of drawers is nearly, if not quite, as fire resistant as the ordinary sheet metal dispatch box.

Steel Used

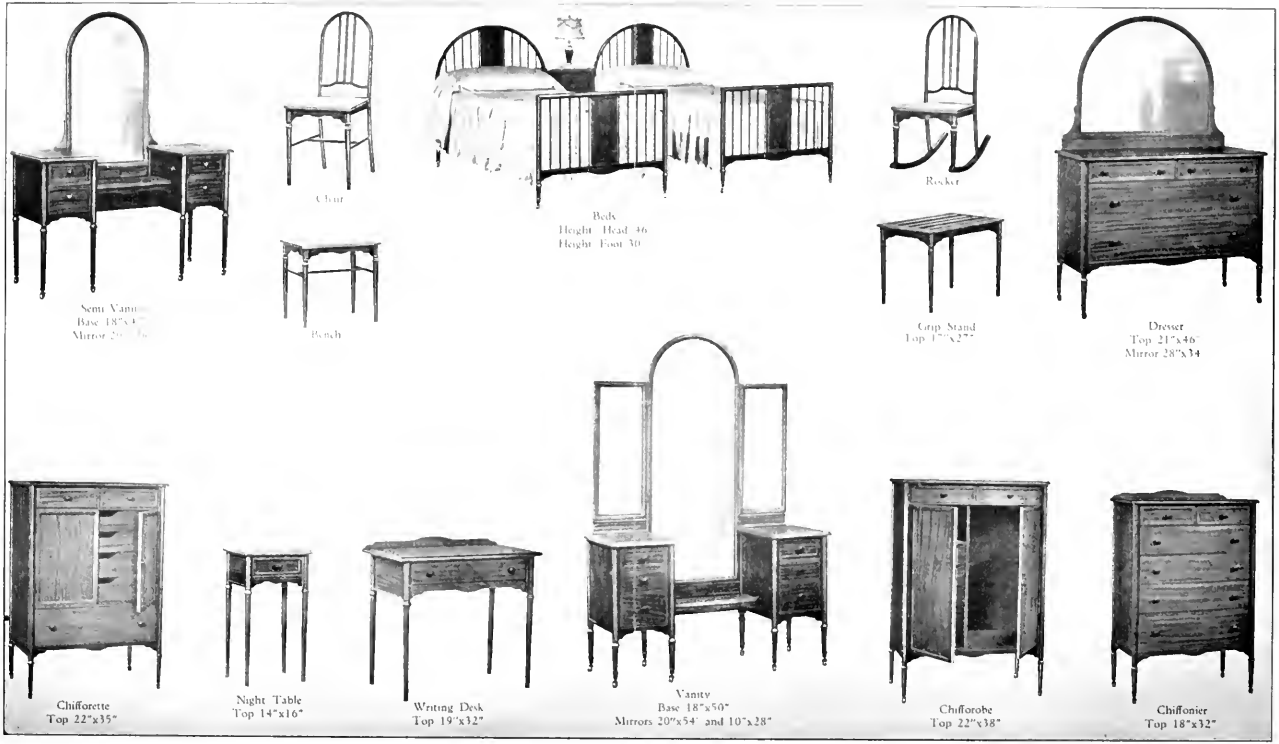
The materials used consist almost entirely of two classes of steel, these being cold finished sheet and cold rolled strip. The frame work of cases is made of seamless tubing, which is formed from cold-rolled strip. Special shapes of tubing such as that required for the legs and posts of bodies or mirror posts are formed by swaging in special machines. The tops of cases, desks and tables are made of cold finished patent levelled steel sheets, as are also the sides, backs and bottoms.

Operations

Not counting the production of the tube used, there are about 280 separate operations required in the production of a dresser before it is ready

A corner in the factory showing a battery of spot welders working on drawer casings.

SIMMONS' METAL FURNITURE ADAPTABLE FOR STATEROOMS



The various pieces shown in the above illustration form a very complete furnishment for sleeping room. Every piece shown is easily fitted into the stateroom of a modern liner. The first cost is less than that of wooden furniture of comparable quality and the first cost is practically the only cost.

Welding the frames of Simmons steel furniture. All welding is done in special jigs so that parts are interchangeable.

for the finishing department. Many of these operations are performed on power punch presses with dies, both on sheets and tubes.

When all of the members or parts are brought together, they are assembled and locked rigidly and accurately in a jig, where all contact points and joints are brazed or welded. This produces a framework which is not only square in all its dimensions, but will remain so, thus preventing sticking and binding of drawers and doors. The end and back panels are slipped into grooves, and the top is bolted on, providing ready means for replacement should a part become damaged.

Finishing

The furniture is finally finished in various colors by a process utilizing high temperatures, provided by oil burners. The simulation of the color and grain of cabinet woods has been brought to a point where the appearance cannot be distinguished from the genuine except by the most experienced eye. Finish in colors in also provided of a quality never possible on wood, for the reason that steel can stand the high temperature necessary to provide a durable finish, something which is impossible with wood. After the heat treatment, the surface is polished, producing what is sometimes called a "piano" finish.

Great ingenuity has been shown in eliminating metallic sound, so that it is hardly apparent. This has been accomplished scientifically by first shortening the wave of vibration and then filtering or deadening, so that metallic sound, clanging, ringing, or any noise caused by shock or blow is not annoyingly apparent.

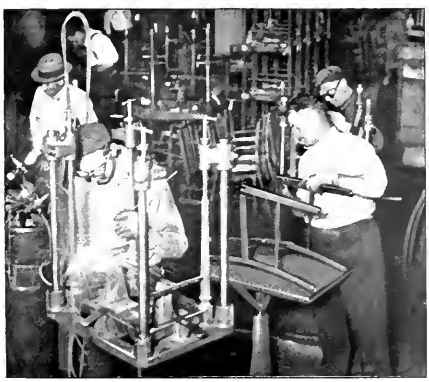
For Marine Use

Furniture aboard ship is subjected to very difficult conditions. Extreme changes of temperature and of humidity, together with the constant weaving motion of the ship's hull, cause a continuous breaking down of joints in wooden furniture and make the maintenance of finish a matter of constant vigilance and attention. Metal furniture meets these extreme conditions so well that it has become practically standard for the United States Navy and undoubtedly it will

Stamping and forming presses in Simmons factory.

soon become standard in first-class passenger liners. The trend of modern design in passenger accommodations is to incorporate in living quarters at sea those fittings and furnishings which give to the stateroom, so far as practicable, the home atmosphere. In planning the first-class passenger accommodations it has been possible in a number of instances to work into the architectural and color schemes standard forms of metal furniture. Since the weight of this furniture is practically the same as that of good hardwood and since its cost is no greater and in some instances considerably less than that of hardwood, there should be a wide use for this new metal product in the marine field.

The valuable characteristics of this new product are many. The use of steel eliminates warping and swelling of all moving parts and obviates all annoyance of deterioration caused by the finish cracking, chipping, and blistering. The material and construction produce permanent rigidity.



Welding chair leg braces.

UTILIZING WASTE HEAT

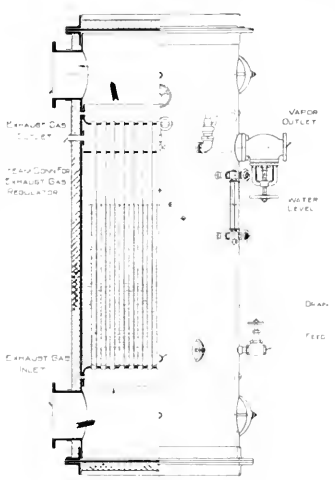
Davis Engineering Corporation Develops an Interesting Fire Tube Steam Generator Especially Adapted for Reclaiming Heat from Exhaust Gases of Diesel Engines

By K. WARREN HEINRICH
Vice-President, Davis Engineering Corporation

WITH the coming of the new era in shipbuilding and the growth of the internal combustion engine as a power unit, several problems have developed that are new to the owner and the operator.

Among the foremost of these are the necessity of supplying heat to the ship's quarters, hot water to its galley, wash rooms, showers and quarters, and heat for the reliquification of the fuel.

These services may be furnished by the employment of electric space heaters, electric water heaters, etc., all of which mean continual operating expense, to say nothing of first cost.



Sectional elevation of the Davis Engineering Corporation's exhaust gas steam generator.

The reliquification of the fuel requires steam which necessitates the installation of a donkey boiler. This boiler is sometimes used to supply heat to quarters and the hot water service in general. This is far cheaper than electric heating, but is in itself a source of operating expense, the largest element of which is the fuel consumed under the boiler. A donkey boiler also takes up some deck space.

With the introduction of the Davis Engineering Corporation's exhaust gas generator and waste heat boiler, these various requirements for hot water and steam can be supplied by utilizing the exhaust of the engines and recovering the heat units contained therein.

The exhaust gas steam or hot water generator is a fire-tube boiler of special design and construction, which takes for its fuel waste heat from some source and with it generates either hot water or steam.

The two main losses in an internal combustion engine are:

(1) Heat carried away in exhaust.

(2) Heat carried away in cooling water.

Each of these amounts to from 25 to 35 per cent of the total heat contained in the fuel used in the engine.

Usually it is hard to utilize the heat carried away in the cooling water, as it is carried away by a large volume of water and at an average temperature of 100 to 130 degrees Fahrenheit. We have utilized this heat by using the discharge circulating water as the feed supply to the generator, and this can be done with profit wherever fresh water is used as the cooling medium.

The temperature of the exhaust gases is rather high, ranging from 500 to 1150 degrees Fahrenheit. However, the heat transmission coefficient is low, and the design of proper apparatus to recover this heat is a matter of exacting engineering application. By passing these gases through the exhaust gas generator we are able to obtain an average evaporation of .77 pound of water with exhaust gases at 600 degrees Fahrenheit and 1.43 pounds water with exhaust gases at 900 degrees Fahrenheit per brake horsepower, supplying steam at 10 pounds pressure, with a generator feed at 150 degrees.

In other words, on a 2000 brake horsepower installation with exhaust gases at 900 degrees Fahrenheit and generator feed at 150 degrees Fahrenheit, we could supply 1430 pounds steam an hour, at 10 pounds a square inch pressure.

It will be noted that the data in attached table of capacities is very conservative, being based on exhaust temperature of 550 degrees Fahrenheit, whereas that temperature is usually about 850 degrees Fahrenheit.

This generator has been installed on many vessels, both merchant and naval, some of which are the motorships Asheby, Jacksonville, Muncove, the yacht Alcyon, the U. S. S. Colorado and about sixty United States submarines.

On the United States submarines, an evaporator unit was fitted with the tube elements within the gas passage tubes, and the potable water thus produced from sea water was found to be so entirely free from all chemical reaction that it was even used for filling water for the storage batteries. An illustration shows this particular unit.

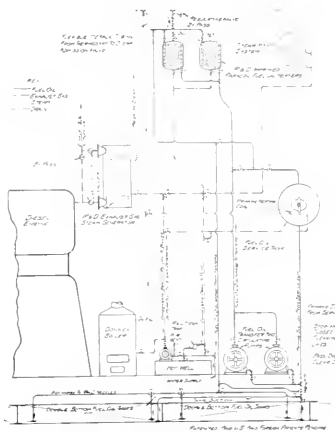
On the motorship Muncove the generator is installed in connection with the RanD system for reliquidation of the fuel, as shown in the diagram of installation reproduced herewith. The exhaust gas generator is installed outside the engine exhaust to muffler, in such a manner as to permit of the generator being cut out and the waste gases by-passed directly to the muffler. The generator is so proportioned that the back pressure will be no greater than that developed when by-passing directly to the muffler. The feed pump takes the generator feed from the hot well and passes it to the generator. (The feed pump may be eliminated under certain conditions and the returns lead to the generator through a closed system.) The steam generated by the waste heat boiler passes

MAXIMUM GEN. RATING B.H.P.	Capacity in pounds per hour based on exhaust gases entering at 550° F.			
	WATER	STEAM		
	40 to 160°	10#	30#	50#
66	330	38	33	29
117	585	66	57	51
168	840	94	81	73
256	1280	143	123	111
300	1500	168	144	130
348	1940	217	186	168
500	2500	280	240	217
620	3150	352	302	273
715	3575	400	343	310
870	4350	486	417	376
880	4900	547	470	425
1090	5450	610	523	474
1220	6100	680	585	530
1320	6595	736	632	572
1490	7430	827	710	643
1720	8650	966	830	750
1860	9303	1040	892	807
2060	10300	1150	990	895
2260	11300	1460	1085	982

to the heaters which take off sufficient steam for their proper functioning, the balance passing through the heating system.

The donkey boiler is used to warm up and start circulation in the RanD system when the internal combustion engine is shut down, and to supply steam for the heating system. This donkey boiler can be entirely eliminated by designing the generator with an oil burner in the bottom combustion chamber, thus generating steam by direct heat application when the engine is not running.

This diagram happens to be that of a marine installation in which the engine cooling water was salt water. On a stationary job where fresh water is used as a cooling supply for the engine, all or any part of this can be led to the generator feed inlet, thereby giving an abundant supply of preheated feed. This procedure increases the over-all thermal efficiency as a part of the heat losses due to cooling are recovered through the use of higher pre-heated generator feed.



Cycle Diagram Showing Exhaust Gas Steam Generator in Connection With R&D System and Heating System

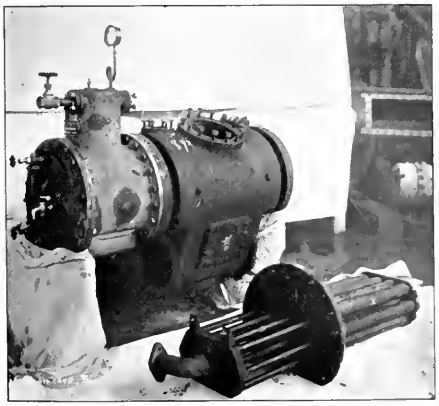
Possibilities of Application

Supplying steam or hot water to:

1. Radiation for heating ships, offices, office buildings, shops, or quarters.
2. Process work, as in canning factories, glass factories, bakeries, laundries, general industrial operations.
3. Operating auxiliaries.
4. Pre-heating boiler feed water in combined plants.
5. Air heating in thermal fan system.
6. Operating evaporating and distilling plants.
7. Pre-heating oil, either fuel oil supply or oil used in industrial process work.
8. Pre-heating all kinds of liquids in chemical, industrial and general process plants.

Possible Waste Heat Supply

1. Exhaust from gas fired internal combustion engines.
2. Exhaust from oil fired internal combustion engines.
3. Stack gases.
4. Blast furnace gases.
5. Exhaust from by-product ovens.
6. Waste heat from open hearth furnaces.



Exhaust gas heater as fitted to evaporator unit on U. S. submarine.

A NEW COMPASS—EARTH INDUCTOR COMPASS FOUND USEFUL AT SEA—INVENTED BY UNITED STATES BUREAU OF STANDARDS

MARKED advantages over the usual types of ships' magnetic compasses are claimed for the earth inductor compass invented at the Bureau of Standards, Department of Commerce. During a recent sea test it was found to be free from roll and pitch error to such an extent that it remained steady under conditions which caused the ship's compass to oscillate two or three degrees. When a sudden change of course was made, the indicator moved freely and without oscillation.

It has a further advantage that the parts affected by the ship's magnetism can be placed in that part of the ship in which they will be least affected, up at the mast head if desired. The indicating instrument is unaffected by the ship's magnetism and can be placed at any convenient point. The two parts are connected by ordinary wires. This compass is the invention of Dr. L. J. Briggs and Dr. Paul R. Heyl of the Bureau of Standards, and for its invention they were awarded the Magellan gold medal. It takes advantage of the fact that the voltage of a direct current dynamo is changed by changing the angle between the field and the brushes. In the compass the earth's magnetic field replaces the field magnet of the dynamo, and the brushes are mounted on the ship and turn with it. The armature is driven by a small electric motor or may be driven by a wind wheel. This type of compass has already been tried out in airplanes where it has proven satisfactory.

DIATOMACEOUS EARTH

An Unique Pacific Coast Industry Develops a Product Particularly Useful for Heat Insulation in the Marine Engineering Field

THE development of a world market for material which was only a curiosity twenty-five years ago is an achievement of which an organization may be justly proud. Twenty years of untiring effort, founded on the sincere belief in and knowledge of the actual value of the product, has made it possible for the Celite Products Company to create a demand for diatomaceous earth in various forms, which is now expressed by one of the greatest and most fundamental of industries.

Diatomaceous earth distributed by the Celite Products Company is a white siliceous mineral weighing only 30 pounds per cubic foot in the natural compact form, and but 8 to 10 pounds per cubic foot when disseminated to a fine powder. Although composed almost entirely of silica, it is not crystalline like quartz, but has an amorphous structure. The fossilized remains of diatoms, constituting the material from this deposit, are microscopically small silica shells of plants which lived in marine waters during the Miocene era and belonged tothe class of Plankton marine diatoms of which only a few deposits have been found.

Loading Celite products on the steamer at Port San Luis, California.

Diatoms have a multiplicity of forms (over 8000 varieties have been classified) and the delicate tracery of intricate designs has been the delight of microscopists. Admitting that diatoms were works of art, they nevtheless had not been put to economic use until 1902, when three men with vision started with a laborer and a mule to quarry and sell diatomaceous earth for insulation of dwellings and refrigerators.

Laboratory

In 1904 a company was organized with a capital of one million dollars, and the output consisted of a carload a week. New men and interests and increased business made it possible to create a laboratory in 1913, and during 1916 and 1917 the industry had already attained national importance. At the present time, the producing company has an able engineering staff, which designs nearly all the machinery used in pulverizing, drying, separating, and classifying the materials. A research staff and laboratory is mainmaintained; the expenditure for technical development work for the past year exceeded $50,000. This research organization and equipment is being concentrated on developing effective uses for the materials, standardizing the methods of application, determining the most economical forms of insulation for different types of equipment, and on other investigations which will allow the user of Celite products to derive from them their maximum effectiveness.

Raw Material

The deposit, judged by authorities to be the largest of its kind in the world, is located entirely within the four square miles which comprise the company's property south of Lompoc, California. The diatomaceous earth is uncovered by quarry methods and exceeding care is taken in the selection of proper strata in order to produce material which will have the required properties for certain uses. Since the crude rock contains as much as 50 per cent moisture, it has to be dried; and although ricks of crude rock are still left to dry in the quarries by natural evaporation, some material is dried artificially. The mills do not grind the rock; disintegrators, designed by men who have been studying this problem for many years, break up the lumps in such manner as not to injure the delicate structure of the individual diatoms. The total connected power at the mills and quarries is in excess of 1500 horsepower.

Air Separation Problem

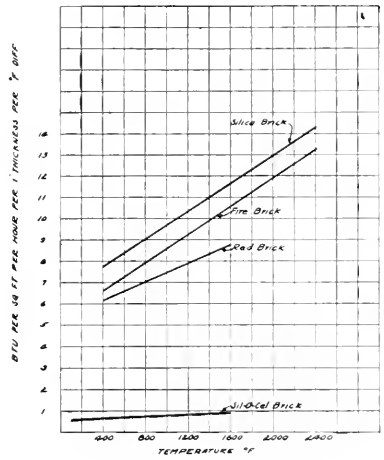
The disintegrated rock is then separated into various grades by means of cyclone air-separating systems and air filters. Some idea of the difficulties encountered may be obtained by recalling the exceedingly light weight of the material, which practically scoffs at gravitational separation and the fact that some grades produced are on the order of 5000-mesh, having particles of 0.00039 of an inch limiting dimension.

An operating force of from 500 to 600 men, or more, is constantly employed at the plant. Employes are housed in comfortable houses, many of them made from the natural Celite blocks, and the camp contains stores, a theater, club rooms, and other facilities.

A standard gauge railroad has been built recently from Lompoc to the plant, a distance of five miles, so as to enable the products to be loaded on cars directly at the plant. It had been necessary to haul the cartons and bags from the mills to Lompoc by a fleet of trucks, each hauling two or three trailers. A portion of the output, especially of Filter-Cel destined for the eastern sugar refineries, has been loaded on steamships at Port San Luis.

Best of All Insulators

Sil-O-Cel insulating brick are unquestionably the highest form of insulating material that has yet been developed. The resistance to heat flow of one of these



Conductivity of Sil-O-Cel Brick, Red Brick and Refractories.

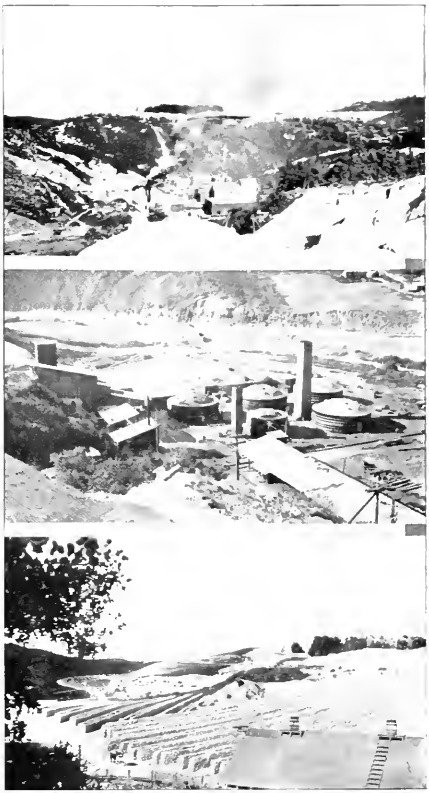
brick is almost uncanny: it is possible to heat one end of a 9-inch brick to a white dripping heat and it will still be possible to hold it comfortably at the other end.

Another brick known as Sil-O-Cel C-22 is made by molding, pressing, and burning the brick to high temperatures. The brick produced has semi-refractory properties which make it especially useful for insulation of equipment, such as oil-fired furnaces, where temperatures are so high that ordinary insulating materials disintegrate, shrink, and lost their structural strength.

All brick are shipped in cartons of 25 each, so that breakage is negligible. The powdered insulation and filtration grades are shipped in large burlap bags of about 90 pounds each. Special bag filling machines had to be designed, as the 90 pounds of loose powder occupies 9 to 12 cubic feet and this has to be compressed into a bag having only 4 cubic feet without bursting the bag.

Besides these products, blocks, mortar, plastic insulating cements, and an insulating concrete aggregate known as Sil-O-Cel C-3 are manufactured.

Sil-O-Cel finds practically an universal field in the insulation of heated equipment. Among the large users are the steel industry for the insulation of hot blast stoves, open hearth regenerators, etc.; the petroleum industry for the insulation of stills and storage tanks; the gas industry for the insulation of coal gas retorts, oil and water gas sets and coke ovens; bakeries for the insulation of bake ovens; ceramic, cement and lime plants for the insulation of kilns; and in all in-



Views at the plant of the Celite Products Company near Lompoc, California. Note great quantities of brick drying in the sun (lower picture).

Switching yards of the Pacific Southwestern Railroad and part of the plant of the Celite Products Company.

dustrial, public utility and heating plants for the insulation of boilers.

Large Quantities Used for Boiler Insulation

The use of Sil-O-Cel in boilers undoubtedly represents the largest single application for the material, and in fact installations for which the exact horsepower has been recorded total three million rated horsepower. Among these installations are represented every make and type of boiler in common use, from the largest in the world to small return tubular boilers for heating purposes.

Similarly, in the marine boiler field the installations range in size from the Leviathan, on which Sil-O-Cel was used after exhaustive tests, to ferryboats and small stern-wheel river steamers. During the war Sil-O-Cel was adopted as standard by the Emergency Fleet Corporation and vast quantities were used in this work.

Under the severe conditions encountered in marine work, the insulating material used must meet rather exacting requirements. The boilers are forced for long periods at high temperatures and only limited space is available for refractory linings, so that the temperature of the first brick in contact with the insulation is necessarily high. The insulating material therefore must be able to withstand very high temperatures without deteriorating or losing its insulating efficiency and it must not disintegrate under vibration.

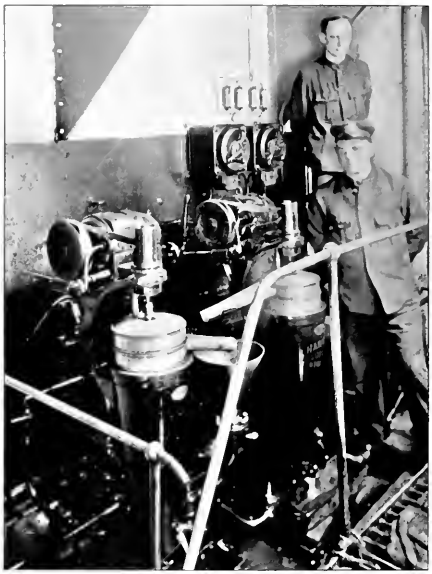
The steel-encased boilers used in marine service require an insulating material which can be placed between the firt brick lining and the casing. After considerable experience in marine practice it was found advisable to use an intermediate course of calcined insulating brick between the fire brick and regular insulating brick. Sil-O-Cel C-22 brick were developed especially to meet this need. They are unaffected at temperatures up to 2000 degrees Fahrenheit, a temperature rarely found behind refractory linings, and they possess high insulating value. In marine boilers a 2½-inch course of Sil-O-Cel C-22 brick is laid next to the fire brick followed by a 2½-inch course of Sil-O-Cel insulating brick next to the casing.

The bases of oil-fired boilers are also insulated with Sil-O-Cel under 5-inch of fire brick. The insulation may consist of a 2½-inch layer of Sil-O-Cel C-22 brick above a 2½-inch layer of Sil-O-Cel insulating brick; or Sil-O-Cel C-3 (calcined granular) may be used beneath a 2½-inch course of Sil-O-Cel C-22 brick.

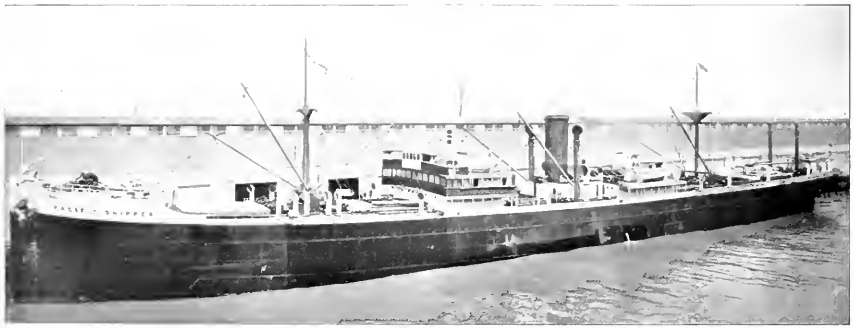
Home Office in California

The home office of the Celite Products Company is in Los Angeles, the management being represented by an executive committee consisting of H. S. Thatcher, who is also general manager; R. J. Wig, and Arnold Fitger, vice-presidents.

Western division sales headquarters are located at San Francisco, A. L. Gossman being divisional sales manager.



One of the interesting visitors to San Francisco harbor during the past month was the British motorship Pacific Shipper. An excellent view of this Furness, Withy freighter alongside her dock is shown below; above is view of her engine room showing two Sharples supercentrifuges installed to take care of the clarifying of fuel oil and lubricating oil used in the main engines.



Pacific Marine Review

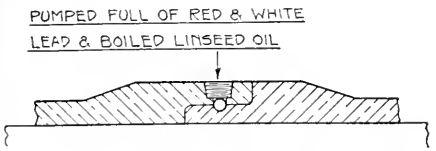
TAIL SHAFT LINERS

Objections to Standard Method of Protecting Steel Propeller Shafts from Corrosion

By RENWICK Z. DICKIE

IN the Journal of the American Society for Naval Engineers of May, 1924, Commander Paul E. Dampman of the United States Navy describes a process for introducing rubber sleeve joints between bronze liner sections on tail shafts to prevent corrosion. The following illustrations and excerpts from this timely article will serve to show the importance of protection for propeller shafts.

In a vessel with underwater body sheathed with copper, the protection of the exposed portions of her shafting from galvanic corrosion is of the utmost importance. Heretofore, the method of obtaining this protection was by means of composition sleeves, shrunk on to the shaft, in sections of such length as could be conveniently handled. If in one piece, and free from porosity, this forms an ideal protection; however, it is rarely possible to make these in one piece, and efficient means of sealing the joints between the sections of sleeve, so as to make a joint which will be and remain tight, are imperative.



A standard joint for bronze tailshaft liners.

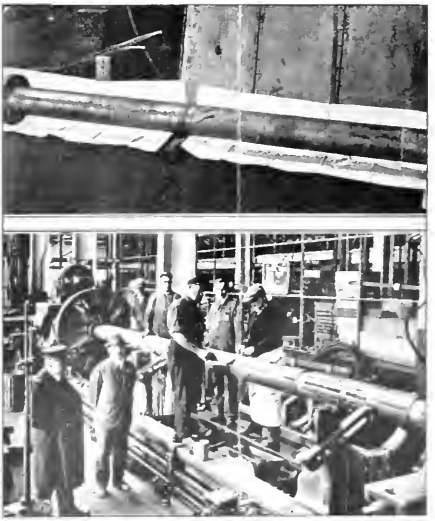
The details of the joint used up to the present time are as shown in the accompanying sketch. The annular ring, between the overlap of adjoining sections, was pumped full of red and white lead and boiled linseed oil. It will be noted that the thickness of the sleeve is greatest at the joint: the purpose of this was to permit the twisting of the sleeve, due to torsion, to come between the joints. However, in practice, this did not work out according to theory. With the working of the shaft, alternately ahead and astern, the joint loosened up, the red and white lead hardened and crumbled, salt water obtained admission to the shaft and active corrosion commenced immediately, and in a very short time the shaft was so weakened as to crack or fracture entirely. Since October, 1922, the Boston Navy Yard has had to replace seven propeller shafts and two stern tube shafts on the Denver, Tacoma, Cleveland, and Galveston.

The Leviathan was recently docked for the United States Shipping Board in the large drydock at South Boston. Among other work done on her at this time, one of the propeller shafts was replaced by a spare, on account of a crack in one of the composition sleeves. It was noticed on this shaft that a space of approximately eighteen inches between two adjacent composition sleeves was filled in with a rubber sleeve. This had evidently been in place since the vessel was built, or at least seven years, and was in perfect condition except for a cut made by the hoisting slings. It was firmly adherent to the steel beneath, which was in perfect condition with no trace of corrosion.

On account of the cut in this rubber sleeve, it was necessary to replace it. After an examination of the old sleeve, the United States Rubber Company declared their ability to replace it and a contract was made and satisfactorily executed by that company.

On docking the U. S. S. Denver, in December, 1923, it was noticed that, on her starboard shaft, much rust was issuing from the joints in the composition sleeves on both the propeller and stern tube shafts, indicating that serious corrosion was taking place beneath. Removal of the sleeve confirmed the fears of the Navy Yard, for the stern tube shaft was found pitted to a depth of one-half inch in several places, the pits being from six to ten inches in length. Cracks in the steel were found extending into the shaft at the bottom of these pits. The shaft was in such condition that it was necessary to condemn it. The propeller shaft, which had been installed new in April, 1923, was found to be pitted circumferentially under each joint in the sleeves, to a depth of approximately one-eighth inch. This shaft, however, was not considered to be so seriously weakened as to prevent its further service, and it was continued in use.

In view of the demonstrated inefficiency of the old type of joint, and having in mind the employment of a rubber sleeve on the Leviathan's shaft, the authority of the Bureau of Engineering to employ rubber sleeved joints on the Denver's replacement shafts was requested and obtained. A new spare stern tube shaft, completely sleeved as per old specifications, was drawn from store to replace the condemned shaft. On this



Above, stern tube shaft of the U. S. S. Denver showing pitting and cracks from corrosion. Below, applying rubber joints between lengths of brass liner on new stern tube shaft for U. S. S. Denver.

it was decided to eliminate the old type joints between the sections of sleeve and to substitute therefor a rubber joint of approximately four inches in length. On the propeller shaft all of the composition sleeves were removed, except the after strut bearing sleeve, and a short section near the coupling, and it was decided to substitute for the sleeves removed a continuous rubber sleeve approximately thirteen feet long.

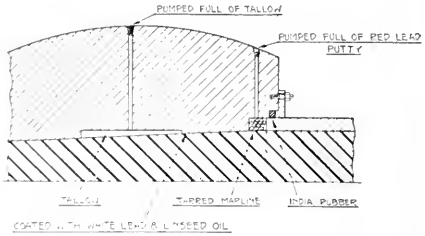
For the long rubber sleeve on the propeller shaft, which was exposed, some form of protection from mechanical injury, and from possible attack by marine growths was considered advisable. (The rubber sleeve on the Leviathan's shaft was within the stern tube.) This protection took the form of a sheet brass strip, one-sixteenth inch thick and three inches wide, made up in a long coil with joints riveted and brazed, and wound spirally over the rubber sleeve under considerable tension. It was secured to the composition sleeves at each end by means of countersunk head machine screws.

In addition to the corrosion due to leakage between sleeve joints, there has been considerable difficulty caused by leakage and corrosion at the commencement of the propeller taper. In order to secure a better and tighter joint at this place, the method shown in the sketch was developed. This has now been in use for over a year and shafts recently examined have shown no signs of corrosion at the taper.

Commander Dampman shows in this article that there is much room for improvement in the standard method of protecting tail shafts from corrosion. A recent series of experiments carried out in San Francisco has indicated a good commercial solution for this problem through the modern art of welding.

These experiments discovered a non-corrosive metal of such properties that its compression factor could be increased or diminished at the will of the operator, that it could be easily built upon a steel shaft by welding, and that the over-all cost could be considerably less than that of the present method.

A series of shallow holes are drilled in the steel



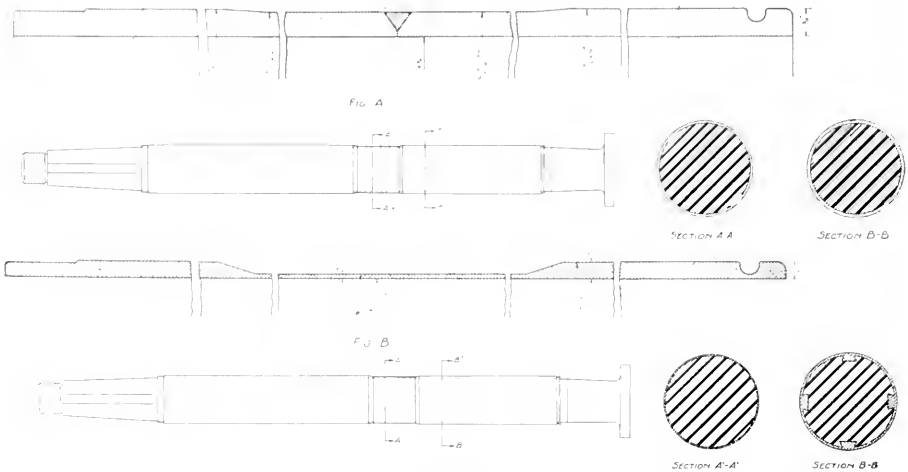
Proposed improvement in joint between shaft liner and propeller hub.

shaft in the way of bearings with an expanding tit drill so as to eliminate any possibility of the liner crawling on the shaft as the material automatically dove-tails itself to the shaft during the application. This process is now being patented.

This lining can be applied with the surface temperature of the shaft not exceeding 400 degrees and can be turned off and renewed at any time. To illustrate the use of this process a drawing is shown of the tail-shaft of the 9600-tonners built by the Moore Shipbuilding Company for the Shipping Board.

Some of the advantages of this new method of lining tail shafts may be recapitulated as follows:

1. Lower first cost;
2. Shaft will be corrosion proof and have longer life;
3. In case of new work, smaller inside diameter bearings can be used;
4. No finish machine work required on tail shaft except propeller fit and coupling flange;
5. Characteristics of lining metal can be made to suit any bearing either of ligumvitae, babbitt, brass, or rubber;
6. Larger diameter shaft may be fitted on account of thinner liner;
7. Linings can be renewed economically and thus avoid loss of shafting.



Detail of tail shaft as used on the 9600-ton standard Shipping Board freighter, showing in Figure A the present method of lining the shaft and in Figure B the new method of applying shaft liner by welding.

CORROSION IN STEAM BOILER PLANT

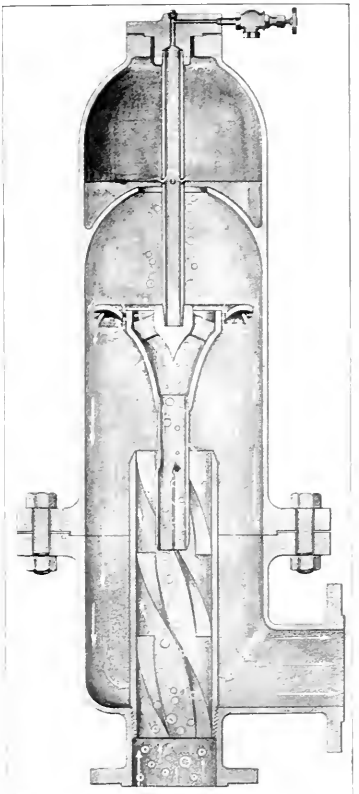
An Automatic Method of Eliminating the Chief Cause of Depreciation in Steam Generating Equipment

By GEORGE E. SWETT

THE trend of engineering research, with the present high stage of development of boilers and other power plant equipment, concerns more the increase of useful life. In other words, the equipment has become so perfected that by contrast the engineering fraternity has felt the needs of methods and apparatus that will reduce depreciation to a minimum.

Various systems have been studied, but because of the uncertain personal or human factor uncertain results have been had, and, further, there are items that cannot be controlled by the hand. The personal factor is keenly felt in the boiler rooms. The solution of the problem seems of necessity to point to the design of automatically operated apparatus. This has been the subject of much research and experiment, and an analysis of the power plant indicates the most vital point is the boilers and their auxiliaries.

It is an accepted fact that corrosion is the most serious source of depreciation, and also that it is the most difficult to combat because it is most acute in places of greatest inaccessibility. There have been many theories in connection with boiler corrosion, the outstanding being chemical and electrical. Each have their merits, but their effects are felt differently in various plants. There are those who believe that the most serious cause of this evil is thermo-chemical, and that the outstanding source of the chemical side is from the gases which enter the system as free gas or dissolved gas in the feed water. These gases in solution are given up under heat and they combine with the entrained gases at the feed water heater, and from this point their destructive action begins. The source of the entrained gases is from the atmosphere and the source of the dissolved gas is principally from the make-up feed water, which indicate that the problem is greatest where the plant is non-condensing and exhausting to atmosphere, although keenly felt in all types of power plants.



Sectional elevation of the improved Hickman air Separator

To combat this cause of corrosion there has been developed an apparatus known as the Hickman air separator, which is designed to intercept these gases at the discharge of the feed water heater, and very gratifying results are being had, it being developed under actual operating conditions over a long period of time. The apparatus is essentially an air chamber with a series of centrifugal nozzles, and separating deflectors and baffles, through which all the feed water passes. The operating principle is centrifugal separation due to difference of specific weights of gas and water, and also by natural separation in low velocity spaces. When the feed water is raised in temperature at the feed water heater, the dissolved gas is freed and combines with entrained gas or forms small bubbles, which are intercepted in the separator; the water passes on to the boilers and the gases are vented to the atmosphere.

The Western Engineering Company of San Francisco are the owners of the Hickman air separator patents and they have made many large installations both ashore and afloat, condensing, non-condensing, and for hot water building service. These installations have been very successful and have proved that the extent of corrosion due to gases has been grossly underestimated.

THE ECONOMY OF BETTER LUBRICATION, a recent publication of the McCord Radiator & Manufacturing Company, contains illustrations of their Class B lubricator adapted to small steam engines, oil engines, gasoline engines, air compressors, steam pumps, and auxiliaries, and points out the phases of economy that can be obtained from proper and efficient lubrication. The outstanding features of economy due to this type of machine, its importance and necessity are all clearly enumerated and described. The booklet contains a complete set of overall dimensions, price lists, and descriptions of this lubricator. Copies are obtainable by addressing the McCord Radiator & Manufacturing Company, Lubricator Division, 2587 East Grand boulevard, Detroit, Michigan.

NEW HIGH PRESSURE TURBINE

De Laval Steam Turbine Company Develops New Velocity Stage Turbine, Especially Adapted to Modern Practice in High Pressure, High Temperature Steam

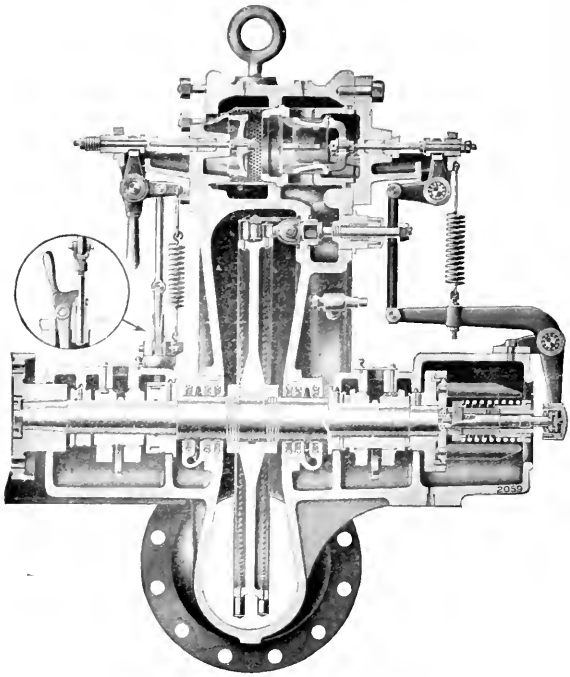
THE recent marked increase in steam pressures and temperatures has made necessary the redesign of many steam-using appliances or else the use of desuperheaters and pressure reducing valves. The latter are troublesome and costly, besides wasting part of the available energy, and in the case of small steam turbines a more satisfactory solution is the employment of materials able to withstand the high temperatures and such an arrangement of parts that high temperatures are kept away from bearings and that expansion due to high temperature cannot cause misalignment. It is also advantageous to reduce heat radiating surfaces as much as possible. These considerations, together with the desire to obtain compactness, simplicity, and improved speed governing have controlled the design of the new De Laval line of velocity stage turbines shown in the accompanying illustrations.

The casing is intended to be supported on a single pedestal at a point close to its center line. The use of a single support diminishes the liability to distortion troubles, as the turbine can expand freely in all directions without affecting the alignment of the shaft. The turbine shaft is supported in two bearings, one at either side of the housing, and is connected to the shaft of the driven machine by a flexible coupling.

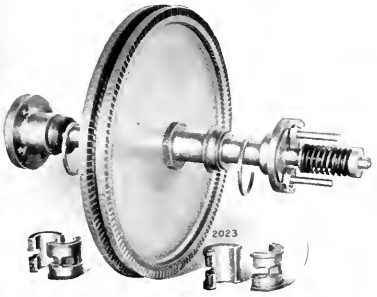
The steam inlet nozzle, steam chest, and governor valves are all included in the upper half of the casing, thus shortening the steam passages and reducing radiating surface, and also keeping high temperature steam away from bearings, bearing oil reservoirs, and bearing supports. Water cooling is not required. The governor valve casing, steam chest, and the upper half of the turbine casing are cast integral and are made of steel for high pressure and high temperature steam. There are no cross-over connections. The only joint in the casing is therefore the horizontal joint at the plane of the center line of the shaft, dividing the lower half or casing proper from the upper half, or cover, and this joint is subjected to steam at exhaust pressure only. The combination of the valve casing with the steam inlet nozzle and steam chest has also made possible a very compact arrangement of the speed governor valve and emergency trip valve, which valves, however, are entirely independent of one another.

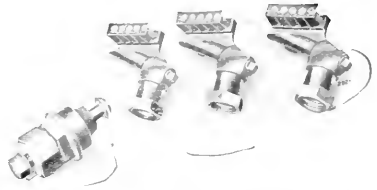
The speed governor weights are pivoted on knife edges supported in seatings carried by a governor flange or body, which is keyed and set screwed to the turbine shaft. When the weights spread apart under the influence of centrifugal force, the motion is transmitted to a pin, which, through a ball thrust bearing, acts upon a bell crank connected by a link to a second bell crank engaging the spindle of the regulating valve. A spring attached to the first bell crank takes up any slack in the mechanism, and also provides supplementary means for regulating the speed. Friction is reduced by the use of roller bearings at all joints and pivots. The governor valves are of the balanced piston type. The valve spindle is made of monel metal.

The emergency trip or overspeed governor is entirely separate and independent from the speed governor and is located on the opposite side of the wheel. An unbalanced ring is hinged on a pin attached to a flange set-screwed to the turbine shaft and is held concentric by a small spring. When a speed 10 to 15 per cent higher than the normal speed is exceeded, the unbalanced force of this ring compresses the spring so that the ring strikes against a trip lever, the upper end of which normally acts as a support to hold a notched rod. As soon as the lever is struck by the emergency trip weight or is pulled out manually, for which purpose a handle is provided, a spring draws the rod



Axial section of De Laval velocity stage turbine





At left: Wheel, shaft, governor, driving half of coupling, and bearings of De Laval velocity stage turbine.
Above: Nozzles with attached interstage guide vanes, also nozzle control valve, of De Laval velocity stage turbine.

down, and the latter, through the medium of a bell crank, closes the emergency closing valve. A slight hammer effect helps to start the closing of the valve. The motion of the valve is in the same direction as the flow of steam, and the pressure of the latter aids in closing the valve and in holding it closed.

To reset the emergency valve, it is drawn back by means of a handle on the bell crank before mentioned until the trip lever can again engage the notch in the rod. When set, the valve is pulled all the way back so that a collar on the monel metal stem seats against the valve cover and prevents leakage of steam, thus relieving the stuffing box. It will be noted that all valves and governor parts are above center line of the turbine shaft and are readily accessible. Where the turbine is to be used to drive a boiler feed pump, a pressure regulating governor can be attached to the casing cover, without removing the regular speed governor.

The steam inlet nozzle is alongside the emergency governor valve, and the turbine is protected by a monel metal strainer located in the governor valve body.

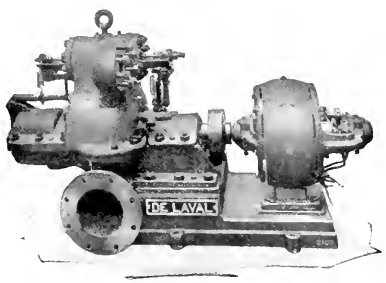
The wall of the steam chest adjacent to the turbine wheel chamber supports the nozzles through which the steam is directed against the wheel buckets. The guide vanes are securely riveted to an extension of the nozzle casting, and the inner ends of the vanes are also supported by a riveted shroud. As the turbine is of the pure impulse type, the steam is completely expanded to exhaust pressure upon leaving the nozzles, and close clearances between nozzles, wheel buckets, and guide vanes are unnecessary, either axially or radially.

Where considerable changes in load or in steam pressure are anticipated, some of the nozzles can be provided with hand operated valves, and by cutting nozzles in or out it is possible to maintain a high average pressure in the steam chest, with correspondingly high efficiency over a wide range of capacity.

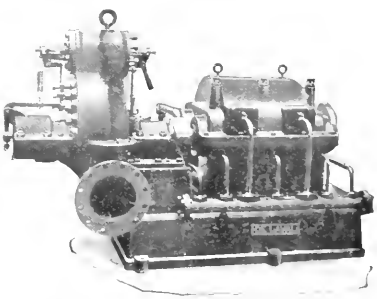
The wheel has two rows of nickle steel buckets, the shanks of which pass through radial holes bored in the overhanging rim of the wheel and are riveted over on the inside of the latter. Shroud strips riveted on the outer ends of the buckets provide rigidity and prevent spilling of steam. Sufficient space is left between the ends of the shroud strips to provide for expansion due to high temperature.

The turbine wheel is a high grade steel forging provided with an ample hub. The wheel is mounted on a heavy, rigid forged steel shaft and is held in position on the shaft by two heavy locking nuts. The stuffing boxes where the shaft passes through the walls of the housing are each fitted with three carbon packing rings, a space cored out between the outside and middle rings providing for steam sealing when operating under vacuum.

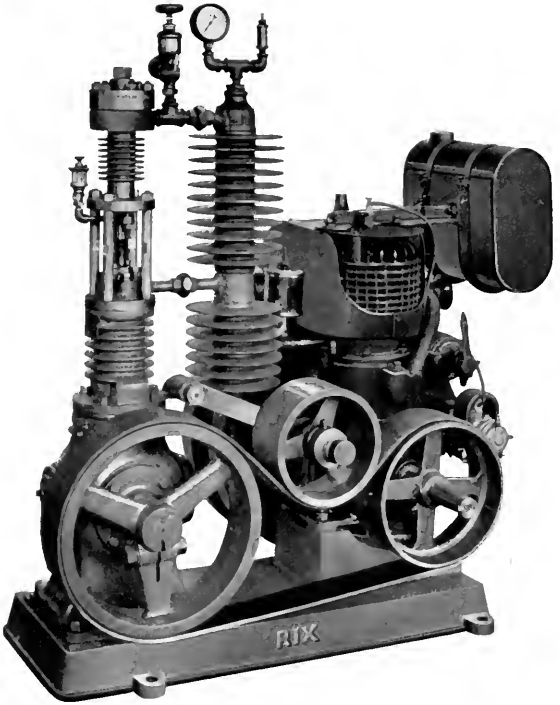
All parts entering into the construction of the turbine are made to limit gauges, to insure absolute interchangeability of parts. The line of velocity stage turbines described in this article is built by the De Laval Steam Turbine Company of Trenton, New Jersey, in sizes from 1 to 1000 horsepower.



De Laval velocity stage turbine coupled to 10 k.w. DC generator



De Laval velocity stage turbine mounted on base plate of speed reducing gear, 185 h.p., 3600 and 430 r.p.m.



Rix auxiliary compressor set for starting bottle air.

Rix Air Compressors

OUR illustration shows a very high grade auxiliary unit manufactured by the Rix Compressed Air & Drill Company of San Francisco for motorships and power stations. A gasoline engine and a two stage air compressor are mounted on the same bedplate and connected through a special short belt drive. For marine use, if desired, these sets can be had with a longer bedplate including a small generator for auxiliary lighting. These sets will handle starting air up to 1500 pounds pressure.

The Rix Compressed Air & Drill Company also manufactures a special auxiliary boosting compressor for motorships. This machine takes the air from the maneuvering tanks at around 350 pounds and boosts it to 1000 pounds for the injection bottles.

The Rix factory reports many interesting orders recently filled or in process. Among these are:

One continuous duty two stage vertical air compressor geared to 25 horsepower Westinghouse motor, and one auxiliary booster geared to a 10 horsepower Westinghouse motor; both for the new diesel-electric dredge of the Port of Portland (Oregon).

One auxiliary compressor for charging injection bottles at power plant, Honk Falls, New York.

Three compressors to Mianus Diesel Engine Works, Stanford, Connecticut.

Three compressors to Houston Wood Preserving Company, Houston, Texas.

Two compressors to Texas Creosoting Company, Orange, Texas.

Of special interest are two experimental jobs. Henry Ford's experimental laboratory at Dearborn, Michigan, asked for a small compressor to compress 2 cubic feet of free air per minute to a pressure of 4000 pounds per square inch. We understand that the Rix Company was the only concern ready to undertake these requirements. The other special order is from John Liming of Smackover, Arkansas, to be used in special experiments for pumping oil in deep wells by compressed air. If these experiments succeed it will mean a great new field opened up for the compressed air industry.

The new Rix catalog No. 150 gives full description and dimensions of the latest models of Rix high pressure compressors.

A HANDY SALVAGE PUMP

THE A. G. Hebgen Co. reports an interesting test of the Sterling portable gasoline engine driven pump. This test is in no sense marine, having been made on the shore of Clear Lake, Lake County, California. However, it shows the capacity and the ability of the pump and is published here because it indicates that this pump would be a very useful and economical handyman for boat and ship owners and for salvage companies.

The Sterling direct-connected gasoline-driven vertical pump is distributed on the Pacific Coast by the A. G. Hebgen Company of San Francisco. The pump is built in Stockton, California, and is fitted with a Johnson twin opposed cylinder high speed engine of the outboard motor type. The entire outfit weighs only 52 pounds and is guaranteed to lift 38 gallons of water a minute to a head of 40 feet or 12 gallons a minute to a head of 100 feet.

One of these pumps was installed recently at the Russ ranch on Clear Lake. On test it filled a 1200 gallon tank in an hour and fifteen minutes, against a head of 120 feet difference in elevation and against the friction head of 240 feet and 1¼ inch pipe. This far exceeded the guarantee and greatly delighted the purchaser and the dealer.

The unit runs practically without vibration and can therefore be used to advantage in places where foundations are difficult to erect. It will run at full capacity on a fuel expense of about 3½ cents an hour.

This self-contained unit with suitable suction and discharge hose should find many useful services aboard ship and in small salvage operations.

MARINE INSURANCE

MARINE EQUIPMENT AND PREMIUM RATES

By CHARLES F. HOWELL, Contributing Editor

INSURANCE, to the mind of the average person, is the means by which indemnity is secured in event of loss. Textbook writers frequently define it as the method of distributing the losses of the few over the many. This limited view of the scope of underwriting protection, while acknowledging its beneficent character, loses sight entirely of the larger sphere it occupies in the industrial and economic life of the time.

Today, as never before, insurance exercises a powerful influence in preventing loss, and its achievements in that direction are of as great value to the community as is its better known phase of supplying indemnity after loss has occurred. Much has been done during the last generation to reduce the loss of life and property through such agencies as the dissemination of information as to the care of the health by life insurance companies, the insistence upon the adoption of proper safeguards against accidents in factories by compensation companies, the active cooperation of fire companies through laboratory experiments and publicity campaigns in promoting improved methods of construction and equipment of buildings so as to prevent fires, and the rules laid down by marine companies for the proper construction, equipment, maintenance and loading of vessels.

It is possibly fortunate for the insuring public that the insurance companies are not compelled to rely entirely upon educational methods for the adoption of their recommendations, but have, in the premium rate, a powerful weapon wherewith to enforce their views. If the owner of a vessel or of a factory can be shown that by building according to certain rules or by the installation of approved safety devices, he can effect, over a period of years, a saving in premium which will more than offset the added original cost, a much stronger appeal is made than by approaching him solely from the standpoint of public welfare.

And this is so, not because of an unwillingness on the part of the owner to cooperate in the prevention of loss, but because business is conducted today on such a narrow margin of profit that an added original outlay without a corresponding compensation will frequently make it impossible for the owner of the more costly property to compete successfully with the rival who is able, because of lower capital expenditure, to offer what from outward appearances is an equivalent service at a lower price.

Importance of Costs

Greatly increased facilities, during recent years, in the production and transportation of merchandise have resulted in such keen competition for the world's markets and for

The Associated Oil tanker Frank H. Buck ashore at Point Pinos, Monterey Bay, California. The upper picture shows Merritt, Chapman & Scott salvage steamer in the offing. The Frank H. Buck went ashore 9.20 p. m. May 3 and was pulled off 8.51 p. m. May 17.

the world's carrying trade that marine insurance costs now occupy a more important part in the calculations of the shipper and shipowner than ever before. It is a common practice among merchants, before quoting on a large foreign order, to obtain from the underwriter the rate of premium, as a failure to properly estimate the insurance charge may result in a loss of profit on the venture; and, other things being equal, the merchant will select as his carrier the vessel which takes the lowest rate of cargo insurance.

Therefore, the vessel owner has a double interest in the rating given his ships by the underwriters, for if he fails in obtaining as favorable a classification for insurance as his competitors he will not only have a higher insurance charge on the hull, in his cost of operation, but will find his vessels discriminated against by shippers in their selection of a carrier. Frequently carriers are compelled to absorb the differential represented by the higher insurance rate charged on cargo by their vessels than on the ships of their competitors.

Since the rate of premium is of such importance to shipowners, a consideration of some of the factors entering into the composition of the rate should be of interest.

Rate Composition

The first thought in the mind of the underwriter has to do with the ownership of the vessel. Some owners, because of their long and excellent records in the operation of vessels, receive a preferred class and their ships are accorded a rating which a new owner, or one of inferior standing, is unable to obtain. This first factor takes into account not only the high moral standing of the owner, but also his loss record. The underwriter is in possession of full information with respect to these two elements through confidential statistics furnished by the classification societies.

The second consideration of the underwriter is the type of construction and equipment of the vessel. While great reliance is placed on the rating accorded vessels by the classification societies, still the underwriter must make a careful study of the relative merits of vessels, based on their type of construction, propelling machinery, equipment and upkeep. Many underwriting offices maintain their own staffs of competent surveyors to satisfy themselves that the vessels are kept up to requirements. Especially is this true with respect to the older tramp vessels and vessels used in those full cargo trades which are considered hard on ships; such trades, for example, as nitrate, ore, sugar, and ore. ample, as nitrate, ore, sugar, and coal.

The past fifty years have witnessed great changes in the carrying trade of the world. In that period the transition from sail to steam, as the mode of propulsion, and from wood and iron to steel, as the material of construction, has been accomplished by no less important improvements in design and equipment. Nor is the end in sight, for we appear to be at the dawning of an era of transition from steam to internal combustion engines, with replacement of coal by oil as fuel. Specialization and standardization in ship construction appear to be the order of the day. Each trade has its own needs and problems, and the naval architect of today is designing a ship to meet those requirements. The oil tanker, the ore carrier, the collier and the ocean grayhound bear eloquent testimony to the versatility of ship architects and builders.

Each change in type of construction or of propelling machinery and each new safety device has an influence upon the insurability of vessel and cargo which must be studied and weighed by the underwriter in order to determine the effect upon the value of the risk. Improvements which make for economy in ship operation do not, of necessity, make for a reduction in loss. Thus the installation of engines in the wooden vessels, while reducing the time and eliminating many of the uncertainties of the sailer, added greatly to the danger of fire and increased the strain on the hulls. Likewise, the increase in the size and speed of ships brought added danger of stranding and collision. When oil was introduced as fuel the fire hazard and explosion hazard were substantially augmented, and while no underwriter is so lacking in vision as to condemn an innovation in ship construction or operation, it behooves him to weigh carefully the effect of radical changes before determining their bearing on the value of the risk.

Rate Reduction Tendencies

Thus you will rarely find an underwriter who, in advance of actual experience, is willing to make an allowance in the rate of premium for the installation of new equipment, or of devices intended for the prevention of loss at sea. However, the experience of underwriters during the last fifty years with the gradually evolving vessel has been reflected in a general downward trend in marine insurance rates. When we compare the rates of today with those of a half century ago we find them but a small fraction of the oldtime quotations; and yet the profits of marine underwriters are as large today as ever before. Many students attribute the downward tendency of rates to an ever increasing competition, but more astute observers realize that the underlying cause is more fundamental and can be traced to the improving methods of building and operating ships and to greater care in the handling of cargo.

When we compare the slow-moving wooden sailing ships of the last century—the victims of the vagaries of the winds, their equipment little more than an anchor and a compass—with the speedy steel motorships of today, equipped with watertight bulkheads, wireless, radio compasses, submarine signals, and all manner of fire fighting and fire detecting devices, we can understand, without further search, the reason for reduced rates.

Wireless, during the past few years, has reached a high degree of efficiency and is undoubtedly the outstanding achievement in the long list of improvements making for reduction of maritime disasters. The public needs no reminder of this fact, for scarcely a week passes without some mention in the press of the saving of life or property at sea through the agency of wireless; and its usefulness, apparently, is only beginning to be understood.

Oil versus Coal

Next to wireless, in order of importance from the standpoint of the marine underwriter, is the increasing displacement of coal by oil as fuel. As already intimated, the insurance men withheld their opinion as to the effect of the change on the loss record until supported by experience. It is now safe to say that the fire hazard has not been greatly enhanced because of the use of oil, and from many points of view the risk of the underwriter has been reduced. The oil burning steamer first demonstrated the advantages of the new fuel by obtaining greater speed and a much wider sailing radius on a given amount. This was due both to the more constant heat developed and the more efficient use of that heat. The reciprocating steam and the turbine engines, which use coal for fuel, have been unable to prevent a large loss of heat which passes through the uptake without being utilized. The greater efficiency gained from oil means that coal burning vessels are longer at sea for a given passage, and on long voyages must make additional ports for fuel. Every added day that the vessel is at sea exposes the venture to those perils against which the underwriter insures and increases the risk proportionately. Likewise, every added port for fuel enhances the underwritten risks, because the danger of stranding and of collision in going in and out of ports is much greater than when a vessel is in the open sea, and the possibility of fire is also augmented.

There is, however, one serious hazard presented to the underwriter of oil burning vessels that is not present with coal burners, and that is the danger of oil damage from leaky tanks and pipes. Large losses have been incurred through leakage of oil on cargo; and recently insurers of flour against all risks have received heavy claims for damage due to the fumes of oil from leaky tanks. The strains on a vessel, from working in a heavy sea, may easily cause a tank or pipe to leak.

Much satisfaction has been expressed with the performance of the turbo-electric drive which makes use of steam driven turbines to turn electric generators and so produce power for the operation of motor units attached to the propeller shafts. The reduction in length of shafting, the smaller size and less numerous steam pipes, and the confinement of the pipes to a relatively small area, instead of running along decks and piercing bulkheads, make for a reduction in serious machinery damage, which is an end much desired by the underwriter as a large part of his particular averages on hull, and his general average charges on hull and cargo, are due to machinery accidents at sea.

The diesel-electric works on practically the same principle with relation to the direct connected diesel as the turbo-electric does to the direct acting turbine depending on the diesel motor to operate the generators, and would seem to possess the same advantages and disadvantages, from the underwriting angle.

The long experience of builders, repairers, and engineers with the reciprocating steam engines has made for a high type of construction, quick and thorough repairing, and efficient operation in the engine room, which has reduced the number of breakdowns due to machinery trouble to a minimum.

Following the war considerable trouble was experienced with the American-made turbines due to faulty manufacture of reduction gearing and the inexperience of engineers. Breakdowns of machinery which require putting into a port of refuge or towing are very costly to the underwriter, and until the new types of propelling machinery have been thoroughly tested it may be expected that underwriters will be slow in voicing their unqualified approval thereof.

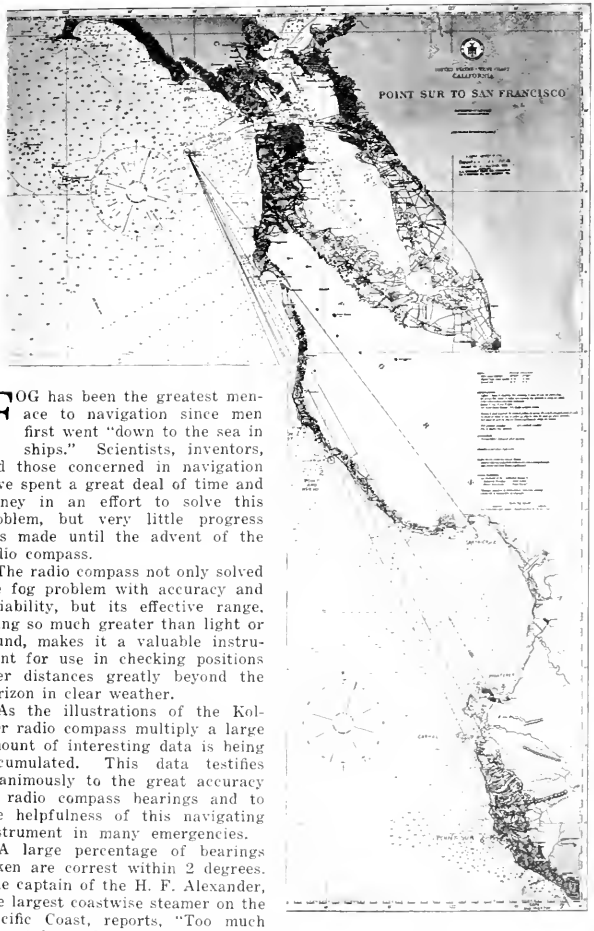
In addition to possessing the advantages of the oil burning steamer, as above pointed out, the motorship does away with the danger of boiler explosion through accident or negligence.

Auxiliaries

Insurance company surveyors are always particularly interested in the condition of the auxiliary machinery of a vessel. They realize the importance to the safety of vessel and cargo of the fire pumps, feed pumps, tank pumps, and circulating pumps. In case of fire the entire venture is dependent largely upon the efficiency of the fire pumps. Often a vessel ashore is required to empty or fill her ballast tanks, or operate her pumps under stress of circumstances when time is all-important and any defect in the pumps might prove a

(Continued on Page 31, Ad. Sec.)

Kolster Radio Compass



FOG has been the greatest menace to navigation since men first went "down to the sea in ships." Scientists, inventors, and those concerned in navigation have spent a great deal of time and money in an effort to solve this problem, but very little progress was made until the advent of the radio compass.

The radio compass not only solved the fog problem with accuracy and reliability, but its effective range, being so much greater than light or sound, makes it a valuable instrument for use in checking positions over distances greatly beyond the horizon in clear weather.

As the illustrations of the Kolster radio compass multiply a large amount of interesting data is being accumulated. This data testifies unanimously to the great accuracy of radio compass hearings and to the helpfulness of this navigating instrument in many emergencies.

A large percentage of bearings taken are correst within 2 degrees. The captain of the H. F. Alexander, the largest coastwise steamer on the Pacific Coast, reports, "Too much cannot be said of the good results of the radio compass." The captain of the steamer Belgenland states, "I have found the automatic transmitter on Fire Island a most wonderful aid to navigation."

The map reproduced herewith shows a graphical story of bearings taken from the San Francisco light ship by the Kolster radio compass on the lighthouse tender Sequoia. Of the seven sets of bearings taken on this occasion by the Sequoia, three showed no error whatever and the maximum error on any set was 1½ degrees.

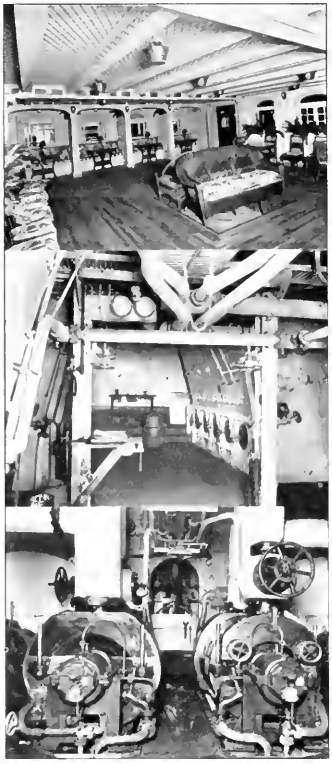
The Kolster radio compass is built by the Federal Telegraph Company of California.

SHIPBUILDING AND SHIP REPAIRING

ONE of the most costly and thorough reconditioning jobs ever undertaken by a Pacific Coast shipyard has just been completed at the Los Angeles Shipbuilding and Drydock Corporation for the Los Angeles Steamship Company on the steamer City of Los Angeles.

The Los Angeles Steamship Company operated this steamer first under agreement with the United States Shipping Board and later purchased her from the Shipping Board. As part of the conditions of that purchase, the steamship company agreed with the Shipping Board to expend not less than $450,000 in the improvement of her motive power. The company concluded, however, that the type and condition of the vessel eminently suited her for the run to Hawaii and therefore decided to considerably increase the required expenditure, installing new boilers, new turbine engines, and replacing much of the auxiliary machinery by new, so that they have given her practically an entirely new power plant capable of a speed of 17 knots and therefore of making the voyage from Los Angeles to Honolulu in approximately five and a half days.

In addition to this work extensive improvements have been made to the already commodious passenger quarters of the vessel. New staterooms have been added; a handsome new tea room has been built aft of the original veranda cafe; elaborate decorations have been carried out throughout the passenger quarters; and new carpets, furniture, and equipment purchased and installed. The City of Los Angeles now has first-class passenger accommodations for a total of 380. The entire cost for this, the biggest reconditioning job ever done at Los Angeles Harbor, is said to exceed a million dollars.



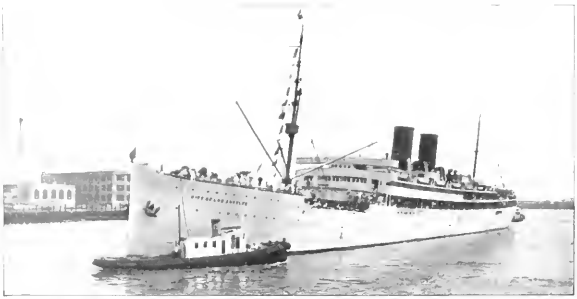
Upper—New tea room off promenade deck. Center—View in forward fire room showing furnace front of Babcock & Wilcox boiler. Lower—View in engine room looking aft between the two high pressure turbines, steamship City of Los Angeles.

The appearance of the ship has been greatly improved by the replacement of her old stacks with new and larger stacks of elliptical form 37 feet in height and 17 feet 3 inches in fore and aft diameter by 14 feet 3 inches in athwart ships diameter.

On the completion of the machinery installation, the steamer City of Los Angeles, displacing 14,750 tons, was lifted on the six section deck of the Los Angeles Shipbuilding & Drydock Corporation for cleaning and painting and for the installation of new propellers. These bladed medium diameter turbine screws replaced the four bladed large diameter wheels of the former reciprocating plant.

After a thorough trial of the machinery, adjustment of compass, and tuning up of all the auxiliaries, the vessel went back to the yard for the finishing touches, and then on Saturday, June 21, cleared with 350 cabin passenger.

On the trials the company very wisely refrained from forcing the new machinery. The vessel made 16.8 knots with the throttle only two-thirds open. Her first day at sea brought report of 13 knots average, the second day 15 knots average. Without doubt after a trip or two she will be averaging well above 17 knots.



The reconditioned steamer City of Los Angeles being warped out from the dock for sea trial

TRADE NOTE

The Th. Goldschmidt Corporation, 15 William street, New York City, announces that they have exclusive selling and promotion rights to the Star Contra-Propeller in the United States, Canada, and Mexico; and that they are authorized in these countries to make quotations, grant licenses, or undertake any transactions for the Star Contra-Propeller; and that they do not hold themselves responsible for any undertakings or statements in this connection not authorized directly by the Th. Goldschmidt Corporation.

Work in Prospect

The New Electra Line, San Francisco, operating the turbo-electric passenger vessel between San Francisco and Portland, Oregon, reports that they will recondition the steamer Dixie, now in New York, for service from San Francisco to Seattle. The Dixie will be brought to San Francisco in August. She will carry 500 passengers and 2000 tons of freight.

Purchasing Agent Oughton of the city of Los Angeles has been instructed by the City Council to advertise for plans and specifications for the fireboat to be built under the $400,000 bond issue.

E. C. Plummer, vice-president of the Shipping Board, announced recently in New York that the Shipping Board will build two new passenger vessels with a tonnage of 32,000 each. The vessels will cost approximately $15,000,000 and will measure 750 feet in length with beam of 80 feet.

The U. S. Engineers, Louisville, will open bids after July 1 for constructing two steel hull dipper dredges, the dredges to be 120 feet by 36 by 7 feet; the main hoisting engine to be 13 inches by 16 inches; each dredge to have six 15-inch spuds.

Recent Contracts

A. W. de Young, Alameda, Calif., was awarded contract for 10 patrol boats for the Coast Guard, 75 feet long by 13-6 feet beam, to cost $22,167 each.

Lake Union Dry Dock & Marine Works, Seattle, Wn., on a bid of $23,800 each, was given contract for 15 patrol boats for the Coast Guard.

Consolidated Shipbuilding Co., Morris Heights, N. Y., will build 15 of the standard patrol boats for the Coast Guard.

Manitowoc Shipbuilding Co., Manitowoc, Wis., received a contract from the Ann Arbor Boat Company, a subsidiary of the Ann Arbor Railroad Company, for a steel twin-screw car ferry to cost in the neighborhood of $800,000. The steamer will be 360 feet over all, 56 feet beam, 16 feet draft. She will have a capacity for 30 freight cars on the main deck. Accommodations will be provided for 46 in crew and 12 passenger staterooms fitted with double berths. The vessel will be propelled by triple expansion engines, steam being provided by 4 Scotch boilers, burning coal.

California Transportation & Improvement Co. of San Francisco will build for its own account two river steamers at the Banner Island Shipyards, Stockton, Calif.. The steamers will be larger than any now plying the Sacramento River.

Bethlehem Shipbuilding Corp., Harlan Plant, has contract for two carfloats, 275 by 37-6 by 10 feet for the Bush Terminal Co.; Sparrows Point Plant, two carfloats 283 by 37-6 by 10-3 for Baltimore & Ohio Railroad.

De Foe Boat & Motor Works, Bay City, Mich., 15 patrol boats for the U. S. Coast Guard, 75 feet long by 13-6 feet beam.

Federal Shipbuilding & Drydock Co. has an order for a freight steamer of 521 gross tons for the Southern Pacific Co.

Sun Shipbuilding Co. has order for two carfloats for the Baltimore & Ohio Railroad, 285 feet over all, 37-6 beam, and 10-3 depth.

Keel Layings

Two carfloats, C. R. R. of N. J., by the Bethlehem Shipbuilding Corp., Harlan Plant, May 1 and 14.

Sternwheel towboat, Jones & Laughlin Steel Corp., by Marietta Mfg. Co., Point Pleasant, W. Va., May 15.

Gleniffer, bulk freighter, Great Lakes Transp. Co., Midland Shipbuilding Co., Medland, Ontario, May 8.

Deck barge, U. S. Engineers, Louisville, Nashville Bridge Co., May 23.

Passenger and freight steamer, Norfolk & Washington Steamboat Co., The Pusey & Jones Co., May 3.

Launchings

Deck barge, Greenville Stone & Gravel Co., Nashville Bridge Co., May 22.

Wm. T. Rossell, hopper dredge, U. S. Engineers, Sun Shipbuilding Co., May 21.

Deliveries

S. O. Co. No. 9, steel oil barge, Standard Oil Co. (Calif.), Los Angeles Shipbuilding & Drydock Corp., May 30.

Alexander Hamilton, passenger vessel, Hudson River Day Line, Bethlehem Shipbuilding Corp., Sparrows Point Plant, May 16; Standard Oil Co. (N. J.), six oil barges, Apr. 15, 19, 24, 28, May 2 and 3; two barges, Hudson River Day Line, May 10.

Oil barges, Mexican Petroleum Co., Federal Shipbuilding & Drydock Co., May 15.

Maneuver boat hull, U. S. Engineers, Midland Barge Co., May 12;

derrick boat hull, U. S. Engineers, May 23.

Three barges, U. S. Engineers, Nashville Bridge Co., May 13.

Self-propelled oil barge, Standard Transp. Co., New York Shipbuilding Corp., May 13.

A. MacKenzie, hopper dredge, U. S. Engineers, Sun Shipbuilding Co., May 28; Oswego and Burlington motor barges, Standard Transp. Co., May 17 and 28.

Repair Awards

Contract for repairing bottom damage to the Associated Oil tanker Frank H. Buck, which recently went ashore at Point Pinos, Calif., was given to Moore Dry Dock Co. on a bid of $139,970 and 38 days. Other bidders were: Bethlehem Shipbuilding Corp., $141,775 and 39 days; Todd Shipyards Corp., $145,600 and 47 days; Los Angeles Shipbuilding Corp., $152,690 and 47 days.

This company also received contract for the installation of a new intermediate cylinder for the Union Oil tanker Coalinga for $17,000.

* * *

Hanlon was low bidder on repairs to Shipping Board freighter West Nivaria on June 6, bid submitted being for $10,992.

* * *

Mare Island Navy Yard was awarded contract for repairs to the Shipping Board liner President Lincoln on a bid of $60,000, $48,000 will be for work on the ship and the remainder for repairs on the cold storage plant.

This yard also submitted low bid on repairs to the President Wilson, submitting an estimate of $28,419. The next bid was submitted by the United Engineering Co. of San Francisco, $33,693.

* * *

The following bids were submitted on renewing a lower section of the stern frame and for voyage repairs to the Shipping Board steamer Pawlet:

For renewing section of stern frame, Mare Island Navy Yard, $11,-233; Bethlehem Shipbuilding Corp., $17,730; Moore Dry Dock Co., $19,-024.50.

For voyage repairs: Crowley Shipyards, $20,201; General Engineering Co., $26,500; Los Angeles Shipbuilding & Drydock Corp., $27,514; United Engineering Co., $29,720; Bethlehem Shipbuilding Corp., $30,-028; Hanlon Drydock Co., $30,450; Moore Dry Dock Co., $30,865; Mare Island Navy Yard, $32,315.

* * *

Yard Notes

Twenty-nine former United States Shipping Board wooden vessels lying idle in Lake Union, Seattle, have been purchased by Captain J. C. Brownfield and associates of Seattle for the Equitable Transportation Company of San Francisco. Captain Brownfield, founder of the Independent Towing Company and part owner of the Washington Tug & Barge Company of Seattle, reports that the hulls may be converted into storage ships, floating salmon canneries, floating fish oil reduction plants, lumber barges, log barges, or general cargo barges.

* * *

The last vessel built by the Rolph Shipyard Corporation, Eureka, California, was launched on June 9. This is a lumber vessel with a carrying capacity of 1,800,000 feet. The shipbuilding plant was recently sold by the Rolph interests.

* * *

Todd Shipyards Corporation for the year ended March 31, 1924, reports net profit of $713,175, after interest and depreciation but before Federal taxes have been deducted, equivalent to $3.39 a share earned on 210,281 shares of no par capital stock.

* * *

Plans and specifications have been completed for reconstruction of the approaches to eleven ferries on the Sacramento River at Sacramento, estimated cost of work being $15,000.

* * *

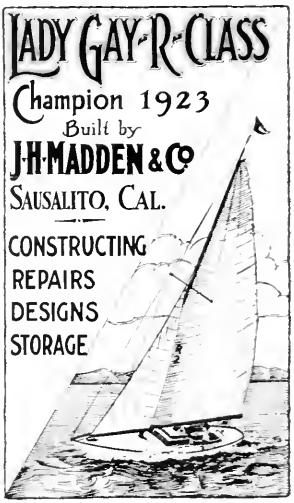
Marine repair plants of Portland, Oregon, have been successful in securing the consent of the Shipping Board to the request that Portland shipyards and repair yards be given the opportunity of bidding on repairs to vessels which are withdrawn from service out of Portland and also that the Shipping Board will allow certain of these idle vessels to remain at Portland, thus enabling these plants to do some of the maintenance and repair work on vessels used out of that port. The Shipping Board has also agreed to send specifications for repairs to ships when these vessels are brought to San Francisco for repair or reconditioning.

* * *

The schooner yacht Aurora, building by J. H. Madden & Co., Sausalito, California, for R. C. Durant, was launched June 15.

* * *

A. W. de Young, Alameda, has been awarded contract by the South Shore Port Co. of San Francisco for lengthening a motor freight boat from 65 to 90 feet.



U.S. ENGINEER OFFICE, 2nd Dist., 85 Second St., San Francisco, Calif. Sealed Proposals will be received here until 11 a. m., July 21, 1924, and then opened, for a light draft wooden hull snagboat. Further information on application.

Progress in Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT
Potrero Works

Purchasing Agent: O. W. Streett.

No name, hull 5322, cargo steamer, Hawaiian Meat Co., Honolulu; 150 LOA; 26 beam; ; loaded draft; 12 mi speed; TE engs.; 2 water tube boilers.

No name, hull 5323, ferry steamer, Richmond & San Francisco Transp. Co.; 234 LOA; 44 10 beam; 12 loaded draft; 13 mi speed; TE engs., 3 Scotch boilers.

No name, hull 5324, ferry steamer, sister to above.

No name, hull 5325, ferry steamer, sister to above.

A. W. de YOUNG
Alameda, Calif

Purchasing Agent, Robt. J. O'Connor.

Barge No. 4, Pac. Portland Cement Co., San Francisco; 106 LBP; 32 beam; 6 ft. 9 in. loaded draft; keel Apr15/24; launched May31/24; delivered June1/24.

Barge No. 5, sister to above; keel Apr18/24, est.; launch May31/24, est.; deliver June1/24, est.

No name, hull 1, cabin cruiser, Coast Guard Service; 75 LBP; 13.6 beam; twin screw, 250 HP Sterling high speed engines.

No name, hull 2, sister to above.

No name, hull 3, sister to above.

No name, hull 4, sister to above.

No name, hull 5, sister to above.

No name, hull 6, sister to above.

No name, hull 7, sister to above.

No name, hull 8, sister to above.

No name, hull 9, sister to above.

No name, hull 10, sister to above.

HANLON DRYDOCK & SHIPBUILDING COMPANY
Oakland, Calif.

Purchasing Agent: R. Barker.

Dan F. Hanlon, hull 89, steam schr D. J. Hanlon; 2500 DWT, 1400 IHP engines; 2 B&W boilers; launched Mar17/24; deliver May15/24, est.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
San Pedro, Calif.

Purchasing Agent: L. A. Hanson.

Catalina, hull 42, excursion stmr, Wilmington Transp. Co.; 285 LBP; 52 beam; 14 loaded draft; 16 loaded speed; twin screw 3 cyl. TE engs, 3600 IHP; 4 B&W boilers; keel Dec26/23; launched May3/24; deliver July1/24, est.

S. O. Co. No. 9, hull 43, steel oil barge, Stan. Oil Co. (Calif.); capacity 3600 bbls; 110 LBP; 45'10 beam; 8' depth; keel Apr18/24; launched May28/24, delivered May30/24.

THE MOORE DRY DOCK CO.
Oakland, Calif.

Purchasing Agent: N. Levy.

No name, hull 167, oil barge, Associated Oil Co.; S. T.; 140 LBP; 30 beam; 7-6 loaded draft; 2 TE diesel engs, 220 BHP; keel May12/24; launch Aug28/24, est.; deliver Sept10/24, est.

NAVY YARD
Puget Sound

Medusa, repair ship for government; 460 L BP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng. 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan 2/20; launched Apr16/23; deliver May15/24, est.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed, turbine eng. 7000 IHP; two WT express type boilers; 10,000 tons disp; keel Apr1/24; delivery Apr1/25, est.

JAS. ROBERTSON SHIPYARD
Alameda, Calif.

Ort, of San Rafael, ferryboat, Richmond-San Rafael Ferry Co., 172 LBP; 38 beam; 9 loaded draft, 12 knots speed; 700 IHP cross comp engs., 2 dry back boilers, 9'2", keel Dec10/23; launched Mar17/24; deliver June21/24, est.

W. F. STONE & SON SHIPBUILDING COMPANY
Oakland, Calif.

Emeraude, hull 54, yacht, for F. A. Hyde; 50 LBP; 14 beam; 6 loaded draft; launched Apr ; deliver May1/24, est.

No name, hull 52, tug, Daniel Const. Co.; 65 LBP; 17 beam; 8 loaded draft; 150 IHP diesel eng; deliver May1/24, est.

Hull 53, barge, Naknek Packing Co.; 65 LBP; 24 beam; deliver Apr1/24, est.

TODD DRYDOCK & CONSTRUCTION CORPORATION
Tacoma, Wash.

Six steel barges, hulls 37-42 inc., U. S. Engineers, Portland; 120x34x7-6 ft; launched May 2/24.

No name, hull 43, passenger and freight stmr, Southern Pacific Co.; 445 LOA; 57 beam; 25 loaded draft; 16 knots speed; 7000 DWT; keel Feb2o/24; launch July19/24, est.; deliver Nov/24, est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty coal barges, Carnegie Steel Co.; 175x26x11; 10 delivered.

Nineteen barges, U. S. Engineers, Louisville, Ky.; 110x26x6-6; deliver July/24, est.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft; deliver 1924, est.

Sixteen barges, U. S. Engineers, Louisville; 110x26x6-6; deliver Oct1/24, est.

Eight barges, U. S. Engineers, Florence, Ala.; 120x30x7; deliver July and Aug/24.

Fifteen barges, Amer. Steel & Wire Co., Pittsburgh; 100x26x9-3; deliver 1924.

Twelve barges, Tenn. Coal, Iron & R. R. Co.; 140x28x8-6; deliver summer 1924.

THE AMERICAN SHIP BUILDING COMPANY
Lorain, Ohio

W. H. Gerhauser, vice-president and director of purchases.

Greater Detroit, hull 785, paddle stmr, Detroit & Cleveland Nav Co.; 535 LBP; 98 beam; 16 loaded draft; 20 mi loaded speed; 3 cyl comp engs, 10,000 IHP; 6 SE and 3 DE Scotch boilers, 14x20; keel Feb10/23; launched Sept14/23; deliver spring 1924.

Greater Buffalo, hull 786; sister to above; keel May2/23; launched Oct27/23.

Henry Ford II, hull 788, bulk freighter, Ford Motor Co.; 590 LBP; 62 beam; 20 loaded draft; 13 loaded speed; 12,000 DWT; 3300 IHP; Doxford diesel engs; keel Dec10/23; launched Mar 1/24.

BATH IRON WORKS, LTD.
Bath, Maine

Purchasing Agent: J. L. P. Burke.

Light vessel 111, hull 92, second-class light

vessel, U. S. Dept. of Commerce; 109-6 LBP; 30 beam; 14-4 loaded draft; 9½ speed; comp eng; 400 IHP; 2 Scotch boilers, 10-6x11-5; keel Aug21/23.

Aras, hull 96, yacht for Hugh J. Chisholm; 118-4 LBP; 18-6 beam; 5-6 loaded draft; 15 mi loaded speed; two 6-cyl gas engs, total IHP 400; keel Dec,23; launched Mar17,24; deliver June1/24, est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT

Quincy, Mass.

Lexington, hull 13[illegible], airplane-carrier U.S.N.

Massachusets, hull 140[illegible], battleship U.S.N.; to be scrapped.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT

Wilmington, Del.

Hull 3489, U. S. Army; keel Dec[illegible], launched Feb2 24; delivered May12 24.

Hull 3490, carfloat, C. R. R. of N. J.; 325 LBP; 38-6 beam; 1030 gross tons, keel May1 24.

Hull 3491, same as above; keel May14 24.

Hull 3492, carfloat, Erie Railroad; 325 LBP; 38-6 beam; 1030 gross tons.

Hull 3493, carfloat, sister to above.

Hull 3494, carfloat, Bush Terminal; [illegible] x10.

Hull 3495, sister to above.

BETHLEHEM SHIPBUILDING CORPORATION, SPARROWS POINT PLANT

Sparrows Point, Md.

Alexander Hamilton, hull 4217, passenger vessel, Hudson River Day Line; 325 LBP; 76 beam over guards; 13-8 deep, 1 TE eng, inclined, 3500 HP; 2 single and 2 double ended boilers, keel Apr2 23; launched Oct20 23; delivered May16 24.

Boston, hull 4218, passenger vessel Eastern Steamship Co.; 385 LBP; 72-6 beam; 23-9 molded depth; twin screw turbine engs, 6400 HP; 6 Scotch boilers; keel Mar13 23; launched Oct27, 23; delivered May27 24.

New York, hull 4219, sister to above; keel Apr3 23, launched Jan12 24; deliver June[illegible] 24, est.

Hull 4222, oil barge, Standard Oil Co. (N. J.); 136 LOA; 23 molded beam; 5-6 depth; keel Feb 11 24, launched Apr2 24, delivered Apr15 24.

Hull 4223, sister to above; keel Feb11/24; launched Apr8 24, delivered Apr19 24.

Hull 4224, sister to above; keel Feb[illegible] 24, launched Apr11 24, delivered Apr24 24.

Hull 4225, sister to above; keel Feb[illegible] 24; launched Apr24 24; delivered Apr28 24.

Hull 4226, sister to above, keel Feb15 24; launched Apr29 24, delivered May2 24.

Hull 4227, sister to above; keel Feb15 24, delivered May3 24.

Hull 4228, barge, Hudson River Day Line; [illegible]x16 ft, keel May1[illegible] 24, delivered May 10 24.

Hull 4229; sister [illegible] delivered May10 24.

Hull 42[illegible], carfl[illegible] B. & O. R. R. [illegible]

Hull 42[illegible]; sister to above.

CLINTON SHIPBUILDING & REPAIR COMPANY

Philadelphia, Pa.

No name, hull 45, [illegible] barge, City of Phila.; 88 LBP; 30 beam; 8 loaded draft; keel June /24, est; launch July/24, est; deliver Aug/24, est.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2757, runabout, Sidney A. Smith; [illegible] HP Speedway engs.

Hull 2763, 45-ft cruiser, C. S. Heinz; 150 HP Speedway engs.

Hull 2764, 30-ft cruiser, H. W. Honan.

Hull 2765, 34-ft play boat, J. F. Brown; 1[illegible] HP Speedway engs.

Hull 2766, 60-ft cruiser, R. C. Reynolds; [illegible] 180 HP Speedway engs.

Hull 2767, 40-ft cruiser, F. S. Shatter; [illegible] HP Speedway engs.

Hull 2769, play boat, Wilson Marshall; [illegible] 150 HP Speedway engs.

Hull 277[illegible], fishing boat, J. F. B[illegible]; 180 HP Speedway engs.

Hull 2773, Exp. cruiser, [illegible] 46x10-6; 1[illegible] HP Speedway engs.

Hull 2774, cruiser, J. B. [illegible] HP Speedway engs.

Hull 2775, yacht tender, [illegible] HP Speedway eng.

COLLINGWOOD SHIPBUILDING COMPANY

Collingwood, Ontario

Royalton, hull 73, bulk freighter, Matthews Steamship Co.; 536-6 LBP; 58 beam; 31 molded depth; 13,000 DWT; 13 mi. loaded speed; 2[illegible] h.p. TE engs; 3 Scotch boilers, 14-10-9; keel Dec11/2[illegible] launch Aug24,24, est.; deliver Sept 15/24, est.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.

Philadelphia, Pa.

Purchasing Agent: [illegible] C. Geer.

[illegible] scout cruiser, U.S.N. [illegible] per cent [illegible] 24.

Memphis, hull 2[illegible], scout cruiser, U.S.N.; keel [illegible] 24 [illegible]

DEFOE BOAT & MOTOR WORKS

Bay City, Mich.

No name, hull [illegible], yacht, builder's account; [illegible] LBP; [illegible] beam, 6 draft; 14 speed; Standard [illegible] engine; keel June [illegible] 2[illegible]; launched Aug 6/[illegible] deliver, July1[illegible] 24, est.

Pe[illegible]mar III, hull 7[illegible], R. E. Olds; 1[illegible] LBP; [illegible] beam; 4 [illegible] draft; [illegible] eng [illegible] IHP; keel Sept1 23; [illegible] Nov[illegible] 2[illegible] [illegible] July [illegible] 24, est.

[illegible] steel car floats, Erie R. R.; 1[illegible] long; 24 beam; 8 depth, launch Apr12 24, est; deliver June[illegible] 24, est.

[illegible] hull 7[illegible], yacht, Aaron De Roy; 62 LBP; 13-6 beam; 4 loaded draft; 16[illegible] IHP gas engs; keel Mar3 24; launch June25 24, est; deliver July 15 24, est.

[illegible] boats for U. S. Coast Guard; [illegible] deliver June[illegible]

DRAVO CONTRACTING COMPANY

Pittsburgh, Pa.

H[illegible] builder's account.

Hulls [illegible] inc., 14 steel barges, Mississippi River Commission, Memphis; 42[illegible] gross tons each.

Hull 312, steel dump scow, U. S. Engineers, Chicago; 127 gross tons.

Hulls 31[illegible] inc., 5 steel derrick boat hulls; 1[illegible] gross tons each; for U.S. Engineers, Louisville, Ky.

Hull 332, steel barge, U.S Engineers, New Orleans; 1[illegible]x3[illegible]x7; 43[illegible] tons.

Hull 333, sand digger; Ohio River Sand Co., Louisville; 155x42x7-6; 430 tons.

Hull 334, sand digger, Keystone Sand & Supply Co.; 155x42x7-6; 430 tons.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY

Kearny, N. J.

Purchasing Agent: R. S. Page.

Hull 79, steel oil barge, Mexican Pet. Co.; keel Mar31/24.

Hull 80, sister to above.

M. P. 24, hull 79, oil barge, Mexican Pet. Co.; 150x30-6x10-6; keel Mar31, 24; launched May7 24; delivered May15, 24.

M. P. 25, hull 80; sister to above; keel Apr 15/24

No name, hull 801, frt steamer, Southern Pacific Co.; 521 gross tons.

GREAT LAKES ENGINEERING WORKS

River Rouge, Mich.

Purchasing Agent: Chas Short.

Benson Ford, hull 245, bulk freighter, Ford Motor Co.; 580 LBP; 62 beam; 20 loaded draft; 13 mi speed; 13,500 DWT; 3300 HP Doxford engs; keel Nov26 23, launched Apr26 24; deliver July1 24, est.

Hull 247, bulk freighter, H. K. Oakes, Franklin S. S. Co., Cleveland; 612 LOA; 586 LBP; 62 beam; 32 depth; 20 loaded draft; 13,500 DW T; 12 mi speed; keel Feb25/24; launch Aug1/ 24, est; deliver Oct1 24, est.

No name, hull 248, bulk freighter, Columbia S. S. Co., Cleveland; 618 LOA; 592 LBP; 62 beam; 32 depth; 20 draft; 13,500 DWT; 12½ mi speed, keel June15, 24, est; deliver Mar1/25, est.

GREAT LAKES ENGINEERING WORKS

Ashtabula, Ohio

Hull 518, dustpan sea., Great Lakes Dredge & Dock Co.; 381 LOA; 40 beam; 14 loaded draft; 1000 yards capacity; keel Mar15 24; launch June12 24, est; deliver June25 24, est.

Hull 519, sister to above; keel Mar15/24; launched June28 24, est; deliver July24, est.

HOWARD SHIP YARDS & DOCK COMPANY

Jeffersonville, Ind.

Purchasing Agent: Jas. I. Howard

Steel tow boat, 140 long, 32 beam, 6½ depth hold.

Two steel river boats, U. S. government.

No name, Algiers Public Service, Inc., New Orleans; 170 feet long.

No name, ferryboat, sister to above.

MANITOWOC SHIPBUILDING CORPORATION

Manitowoc, Wis.

Pere Marquette 21, hull 21, car ferry, Pere Marquette Ry. Co.; 345 LBP; 57 beam; 16 loaded draft; 14 mi loaded speed; 2 sets TE engs; 2750 total IHP; 4 Scotch boilers, 14x10 ft 11 in dia; 180 lbs. pressure; keel Jul 24, launched Mar18 /24; deliver May 24, est.

Pere Marquette 22, hull 22, sister to above; keel Dec29 23, launch summer 24.

Hull 213, steel barge, Mar Sept. U. S. Govt.; 175 ft long; 46 ft molded beam; 11 ft 6 in molded depth; keel Mar8 24.

Hull 212, steel tug, Great Lakes Dredge & Dock Co., Chicago; 110 over all; 24 molded beam; 11 ft molded depth; 1000 HP Earlhagen Morse CO engs; keel Jan12 24; launch Apr27/ 24, est.

Hull 213, sister to above; keel Jan15/24; launch Apr7 24, est.

MARIETTA MANUFACTURING CO

Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm

Sailor, hull 137, towboat, Jones & Laughlin Steel Corp.; 165 BP; 32 beam; 7.6 depth; 105 gross tonnage; 9x32x8 ft tandem comp. engs; western river return tubular boilers; keel Oct 1/23; launched Mar25 24, deliver June15 24, est.

No name, hull 138, sternwheel towboat; 125x 30x5.2, tandem comp. engs; Western rivers return tubular boilers; keel Mar1 24.

No name, hull 139, sister to above; keel May 15/24, launch July1 24, est; deliver July15 24, est.

MIDLAND BARGE COMPANY

Midland, Pa.

Purchasing Agent: H. Seal

Hull 32, motorship boat hull, U.S. Engineers, Burlington, W. Va.; 61 LBP; 20 beam; 7.3 DW T; keel Jul 1 23; delivered May12 24.

Hull 33, derrick boat hull, U. S. Engineers, Mobile; 56 LBP; 34 beam; 5.6 DWT; keel Feb 1 24; delivered May23 24.

Hull 34, steel fuel oil barge, F. T. Stifler Co., New Martinsville, W. Va.; 125 LBP; 50 beam; 4.0 DWT; keel Feb15 24; launch June15 24, est.

MIDLAND SHIPBUILDING COMPANY, LTD.

Midland, Ontario

Purchasing Agent: R. S. McLaughlin

Glenifler, hull 12, bulk freighter, Great Lakes Transp. Co.; 350 LOA; 50 beam; 20.6 draft; 3 Scotch boilers; keel May8 24; deliver spring 1925.

NASHVILLE BRIDGE COMPANY

Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

Hulls 62 64, barges for U.S. govt.; 80 LBP; 26 beam; 5 loaded draft; keels Mar20/24, est; delivered May13, 24.

No name, hull 65, dredge, W. T. Hardison & Co.; 110 LBP; 30 beam; 6 loaded draft; keel July15 24, est; delivery Aug15/24, est.

Hulls 66-71, inc, pontoons, U.S. Engineers, Cincinnati; 40 LOA; 12 beam; 3 loaded draft; keels June10/24, est, deliver Aug15, 24, est.

Hull 76, deck barge, U.S. govt., Louisville; 120x35x7; flush deck; keel April7 24.

Hull 77, sister to above; keel May23, 24; launch June23 24, est.

Hull 79, deck barge, Greenville Stone & Gravel Co.; 120 LBP; 30 beam; 7 loaded draft; keel Apr29/24; launched May22 24.

Hull 80, deck barge, builder's account; 100 LBP, 24 beam, 5 loaded draft, keel July1, 24, est.

No name, hull 81, dredge boat hull, T. L. Herbert & Sons, 110 LBP; 30 beam; 6 draft, keel July20/24, est; launch and deliver Sept1, 24, est.

NAVY YARD

Boston, Mass

Whitney, destroyer tender No. 4, U.S. Navy; 460 LBP; 61 beam; 21 loaded draft; 16 knots loaded speed; 9000 SHP; 4 sets, 7000 SHP geared Parsons turbines; 2 WT express type boilers, keel Apr3 24, launched Oct12/23, deliver Aug 1/24, est.

NAVY YARD

Philadelphia, Pa.

Dobbin, hull 7, destroyer tender, U.S.N.; 460 LBP; 60 beam; 21 loaded draft; 16 loaded speed; 9,000 tons d.; Parsons geared turbine single screw engs; 7,000 SHP; 2 WT boilers, keel Dec23 19; launch Mar5 21, deliver July 1/24, est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

Newport News, Va.

Purchasing Agent: Jas. Plunkett, 233 Broadway, New York City.

George Washington, hull 276, freight and passenger steamer, Old Dominion Steamship Co.; 573.6 LBP; 73 beam; 29.9 depth; speed 16 knots; 21000 DWT; Newport News Curtis turbines; 4750 SHP; BAW boilers, keel Mar10, 24, launch Sept /24, est, deliver Nov 24, est.

Robert E. Lee, hull 277, sister to above; keel Mar12 24, launch Oct 24, est, deliver Jan 25.

No name, hull 278, motorship steamer, Clyde S. S. Co.; 485.6 LBP; 63.4 beam; 33.6 depth; 14½ loaded speed, 2600 DWT; Newport News Curtis engs; 4200 SHP; 4 Scotch boilers.

No name, hull 27 , sister to above.

NEW YORK SHIPBUILDING CORP.

Camden, N. J.

Purchasing Agent: L. G. Buckwalter

Hull 2 , self-propelled oil barge for Standard Transp. Co.; 445 ft long; 58 ft beam; 3 HP Diesel engs; keel Dec27 23; launched May5, 24, deliver May13 24.

Hulls 2 4, two carboats, Harlem Transfer Co.; 2 long; 27 long, keels spring, deliver summer 1924.

Hulls 2 9, two carfloats, N. Y. Cent. R. R. Co.; 2 tracks; 3 long; keels spring, deliver summer 24.

THE PUSEY AND JONES CO.

Wilmington, Del.

Purchasing Agent: James Bradford

No name, hull 264, steel combination steamer, Norfolk & Washington Steamb. Co., Washington, D. C.; 292.7 LBP; 54 beam; 13 loaded draft; about 18 mi speed; 3600 DWT; single screw, 4 cyl. engs; 4000 IHP; 4 Scotch boilers, 12.6; keel May3 24; deliver July1 24, est.

SPEDDEN SHIPBUILDING CO.

Baltimore, Md.

Purchasing Agent: Clement

M. M. Davis, hull 25, boiler tug, A. I. Taylor & Bros., deliver May30 24, est.

Hull 2 , steel hull tugboat, Grace Line, Inc., N. Y.; 96 LOA; 19 beam; 10 depth; 420 IHP; Ingersoll Rand oil engs; keel Nov 24, est.

STATEN ISLAND SHIPBUILDING COMPANY

Staten Island, N. Y.

Purchasing Agent: R. C. Miller

No name, hull 747, steel dieselelectric tugboat, Penn. R. R. Co.; 105 LBP; 24 beam, 13.5 loaded draft.

No name, hull 750, steel dieselelectric tug boat, Standard Rolling Co.; 94 LBP; 21 beam; 11.3 loaded draft

No name, hull 751, sister to above.

No name, hull 752, sister to above.

SUN SHIPBUILDING COMPANY

Chester, Pa.

Purchasing Agent: H. W. Scott

A. Mackenzie, hull 58, hopper dredge, U.S. Engineers; 245 LBP; 46 beam; 19-6 loaded draft; 1915 loaded speed; 2000 DWT; diesel-electric drive; keel May9/23; launched Nov20/ 23; delivered May28 24.

W. L. Marshall, hull 59, sister to above; keel Mar26/23; launched Nov20/23; deliver June10/ 24, est.

Dan C. Kingman, hull 60, sister to above; keel June18/23; launched Mar22/24; deliver June 1, 24, est.

Wm. J. Rossell, hull 61, sister to above; keel June1 23; launched May21 24; deliver July1/ 24, est.

Oswego, hull 76, motor barge, Standard Transportation Co.; 264 LOA; 40 beam; 14 depth; 2 350-BHP diesel engs; keel Dec20/23; delivered May17, 24.

Burlington, hull 77, sister to above; keel Dec 20/23; launch Apr12/24; delivered May28, 24.

Hull 81, carfloat, B. & O. R. R.; 285 LOA; 37-6 beam; 10-3 depth.

Hull 82; sister to above.

THE CHARLES WARD ENGINEERING WORKS

Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Greenbrier, hull 61, U.S. Lighthouse tender; 164-6 long by 32-6 by 5; 2 non-condensing HP engs, 15-inch diam cylinder, 84-in stroke; 3 Mississippi River type boilers, 26 ft long, coal burning, natural draft; keel June26/23; launched Nov13 23; deliver June28/24, est.

C. B. Harris, hull 31, 24-in pipe line dredge, U.S. Engineers, Cincinnati, O.; 175 long by 50 by 8½; pumping engs, 1000 BHP McIntosh & Seymour diesel; 2 aux 225 BHP McIntosh & Seymour engs; keel Sept20/23; launched Feb21/ 24; deliver July1, 24, est.

Lookout, hull 33, towboat, U.S. Engineers, Nashville, Tenn.; 116 ft long; 29 ft beam; 5-6 depth; 2 surface condensing tandem comp engs, 1000 HP; 1 watertube boiler; coal burning; natural draft; keel April7 24, launch June14, 24, est.; deliver Sept29 24, est.

No name, hull 34, quarter boat, U. S. Engs., Huntington, W. Va., 106 long; 26 beam.

Repairs

BETHLEHEM SHIPBUILDING CORP., UNION PLANT

San Francisco

Dock, paint, misc.: Makiki, Olinda, Guerrero, Lenador, Hoven, Cambrai, Manulani, S. C. T. Dodd, W. S. Porter (also engine, boiler, hull), Schalk, Smalley, Water Nymph, Coahuila, Piston repairs: A. F. Kent, R. J. Hanna, Dakotan, Lurline, Olympic. Propeller repairs: Manulani, Mexico, Olympic. Engine repairs: Hagood, Cathwood (also hull), Warnecke, Tahiti. Engine, boiler, hull: McKittrick, F. A. Wattner, Argyll, Wm. F. Herrin, Bolivar (also drydock, paint). Pipe repairs: Panama, Sunland, Astoria, Pennsylvanian. Make 1 lower hull rudder: Camarinal. Telemotor repairs: Saldhill; tailshaft: Venezuela, Bolivar. Damage repairs: Coahuga. Boiler repairs: Buford. Misc.: Martinez, Lebec, Pomona, F. A. Hitchcock, Wm. Storey, Santa Clara, Supervisor, Peterson Launch No. 12 (installed diesel engine), Halco, Deroche, La Purisima, Malolkona, Californian, Hagan, Capt. A. J. Lewis, Santa Paula, K. R. Kingsbury, Samoa, Dauntless, Breckenridge, Hartwood, Tuscarbora, Georgia, Los Alamos, Cons. Bay Barge No. 4, W. S. Miller, Rose City, Tejon, Corvus, Vancolite, Makona, Halco, Nayarit, Charlie Watson.

COLLINGWOOD SHIPBUILDING COMPANY, LTD.

Collingwood, Ontario

Lengthen 72 feet: Glensda. Boilers lowered: Riverton. Bottom damages: Sarnohite (misc.), Riverton, Maplecourt, Manitoba (also misc.). Tailshaft drawn: Canadian Sower, Michipicoten (also misc.).

TODD DRY DOCKS, INC.

Seattle, Wn.

Dock, clean, paint, misc.: Hanley, Fulton, Rancocord, Pomona, Indra, C. S. Holmes, Evan Thomas. Repack condenser: Alice M. Alexander. Docked for survey: Edward Luckenbach, Admiral Peary. Docked for changing tailshaft, etc.: Ayaka Maru. Hatch covers furnished: Julia Luckenbach, Katrina Luckenbach. Misc. repairs: H. P. Alexander, tug Humaconna, C. M. & St. P. barge No. 6, Sol Duc, Pedro Christopherson, Wash Tug & Barge Co.'s barges Nos. 19, 46, 14, 44, 62, 10, 63, 12, 14, 33, 48, 52, 53, 58, 61, Contra Costa, President Jackson, President Jefferson, Halligyn, President Grant.

YARROWS, LTD.

Victoria, B. C.

Dock, clean, paint, misc.: Princess Adelaide, Motor Princess, Canadian Britisher, Princess Victoria, Certs, Princess Alice. New H. P. crosshead: Canora. Fitted 3 new propeller blades, misc. repairs: Mina Brea. Deck and engine repairs: Camilla Gilbert. Docked for survey: Tatjana. Boiler repairs: Satsuma. Engine room repairs: Princess Charlotte.

PERSONAL PARAGRAPHS AND ITEMS OF INTEREST

ENTHUSIASTIC praise for the service and accommodations of the United States liner America is contained in a message received as we go to press from J. S. Hines, publisher of **Pacific Marine Review**, who recently returned from an interesting survey of European shipping and industrial centers. Aboard the America, en route to New York, Mr. Hines renewed his friendship with Captain William Rind, who has been the commander for five years. In 1820 Captain Rind visited San Francisco while on a tour of the world. On a previous visit to the Golden Gate he took the Matsonia to the war zone via Chilean ports. On Jun 25, 1918, Captain Rind encountered and destroyed an enemy submarine, while commanding the U. S. S. Dockra. Since the America entered the trans-Atlantic passenger trade, following reconditioning three and a half years ago, she has earned a world-wide reputation for comfort and equipment. Testifying this statement is reference to her frequently large waiting list of prospective passengers. Mr. Hines was with Pat Brennan, the America's chief engineer, for an inspection of the power plant and was impressed with the excellent condition of the engine room.

Captain William Rind, S. S. America

S. L. Kreider, Los Angeles whose activity in Southern California shipping is an important factor in development.

KREIDER ACTIVE

S. L. Kreider, one of the shipping leaders of Los Angeles, was among the Pacific Coast representatives who made a trip to New York for the purpose of attending the reception and dinner given on board the steamship Leviathan on June 11 to agents from all parts of the United States. On his return to Los Angeles, Mr. Kreider inaugurated a series of educational meetings with members of his staff, in order that they might be fully equipped to "sell" the Leviathan to the public.

Mr. Kreider has come to the front as have few shipping personalities on this coast. His steamship agencies, covering both passenger and freight, include the Toyo Kisen Kaisha, French Line, Texas Transport & Terminal Company, General Steamship Corporation, Winge & Company, Transatlantic Steamship Company, Ocean Transport Company, Ltd., and Kerr Steamship Company.

Within the last month Mr. Kreider has been advised by Kermit Roosevelt, president of the Roosevelt Steamship Company, Inc., that he has been appointed managing agent for that company for Southern California. This will give the Roosevelt Line three Southern California offices under Kreider Los Angeles, San Diego, and Wilmington.

WILLIAMS LINE, SEATTLE

A. F. Zipf, Pacific Coast manager of the Williams Line, announces additional terminal facilities at Seattle, with continuance of use of the Spokane street terminal as the Williams Line's discharge terminal, and arrangements have been completed for the unit consisting of the Hanford, Stacey and Whatcomb docks as the out-loading point. The object is to assemble eastbound cargo on the Hanford dock of the terminal for out-loading to north Atlantic ports of call, so that vessels after taking lumber from other Puget Sound points may return to Seattle and lift Seattle general cargo and lumber and sail direct from the Hanford terminal, calling at San Francisco en route to the Atlantic. This arrangement gives the Williams Line practically direct service to the north Atlantic and assures service at least equal to the best and fastest from Puget Sound. Mr. Zipf also announces the appointment of John L. Burnside as general agent at Puget Sound. Mr. Burnside has been connected with shipping in the Pacific Coast territory since 1904 and is widely known and popular throughout the Northwest.

Pat. k Brennan, chief engineer S S Amer

PACIFIC MARINE REVIEW'S
INTERCOASTAL-OFFSHORE-COASTWISE
DIRECTORY
LINES SERVING PACIFIC COAST PORTS

INTERCOASTAL

SAN FRANCISCO

AMERICAN-HAWAIIAN S. S. CO.
215 Market street. Phone Douglas 9560.
FREIGHT ONLY
SAILINGS—Weekly from Seattle, Tacoma, Portland, San Francisco, Oakland, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Garfield 4180.
PASSENGERS AND FREIGHT.
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles, and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between San Francisco, Seattle, Vancouver, B. C., Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, Hampton Roads, Newport News, Portsmouth, Va.

GARLAND STEAMSHIP CORP.
244 California street. Phone Sutter 1547.
FREIGHT ONLY.
SAILINGS—Every week between San Francisco, Los Angeles, Portland, Seattle, Tacoma, New York, Boston, Philadelphia, Baltimore, Norfolk, Hampton Roads, Newport News, Portsmouth, Va.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
311 California street. Phone Garfield 4180.
FREIGHT ONLY.
SAILINGS—North Atlantic - Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York, Boston.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans, Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Company, Pacific Coast agents.
215 Market street. Phone Kearny 5120.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland and Seattle.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3560.
SAILINGS—Passengers and Freight.
Every 28 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Manzanillo, Los Angeles, San Francisco.
SAILINGS—Direct Freight Service.
Every 7 days. Eastbound via San Francisco, Los Angeles, Westbound: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARRIBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Offices: 550 Market street. Phone Douglas 1666.
Freight and Operating Offices: Pacific Steamship Co., 60 California St. Phone Sutter 7400.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
W. D. Bennett, Pac. Coast Mgr.
311 California street. Phone Garfield 4744.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco.

UNITED-AMERICAN LINES, INC.
Seaboard & Gulf Steamship Co., Pacific Coast Agents.
240 California street. Phone Garfield 2546.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Boston, Los Angeles, Savannah, and Los Angeles, San Francisco, Portland, Puget Sound.

WILLIAMS LINE
Williams Steamship Company, Inc.
A. A. Zoller, Pacific Coast Manager.
100 California street. Phone Douglas 1670.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Los Angeles, San Diego and New York, Boston, Philadelphia, Baltimore.

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Deach, Jr., agent.
Maynard Building.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles
SAILINGS—
Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Alaska Building.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
Agents.
FREIGHT ONLY
SAILINGS—Intercoastal Service.
Regular sailings between San Francisco, Seattle, Vancouver, B. C., Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, Hampton Roads, Newport News, Portsmouth, Va.

GARLAND STEAMSHIP CORP.
Agents.
FREIGHT ONLY
SAILINGS—

HEATH SIRENS

Heath Engineering Laboratories, Inc., of San Francisco, announce the installation of Heath electric sirens on the San Francisco harbor pilot boats Gracie S. and Adventuress. The signals used are of the I-32 type, especially designed and constructed for every requirement of pilot boat service under all conditions. The sirens are 1 horsepower, 24 volt, direct current, and have a 10-inch aluminum motor. The dimensions are: height, 36 inches; width, 16 inches. The weight is 125 pounds. The same type of Heath automatic electric siren is adaptable for motorboat and general commercial craft use. It is interesting to note that the gigantic siren atop the San Francisco ferry tower was manufactured in San Francisco by the Heath organization. Motorships present a broad field for Heath signalling types and indications point to a widespread use for this type of ocean carrier. Heath sirens are also designed for every type of pleasure craft.

DOLLAR LINE

Hugh Mackenzie, general passenger agent of the Dollar Steamship Line, announces the completion of a handsome de luxe pictorial album, portraying life of a voyager enjoying the globe-circling cruise in Dollar round-the-world service. The album is given over exclusively to actual scenes taken from Dollar Line carriers.

ROBERT JUNE

H. A. Sparrow has joined the Robert June engineering management and industrial advertising organization of Detroit. He is a graduate of Rensselaer Polytechnic Institute with an M.E. degree. He served as assistant sales and advertising manager of the London Steam Turbine Company of Troy, New York, and later as plant engineer with the New York Telephone Company of Brooklyn.

INTERCOASTAL

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
L. C. Smith Building. Phone Elliott 1206.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland, Los Angeles, Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
Pier 6. Phone Elliott 3397.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco, Portland, Tacoma and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt.
Lobby 4 Central. Phone Elliott 6383
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Office: 714 Second avenue.
Pacific Steamship Company, agents.
L. C. Smith Building. Phone Elliott 2068.
SAILINGS—Intercoastal.
Regular intervals between New York, San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
Transmarine Corporation.
4471 White Building. Phone Elliott 6127.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles and San Francisco.

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, agents.
Arctic Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
Spokane street terminal. Phone Elliott 6037
FREIGHT ONLY.
SAILINGS—Intercoastal.
Regular monthly sailings between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, New York, Philadelphia, Norfolk and Baltimore.

LOS ANGELES

AMERICAN-HAWAIIAN S. S. CO.
W. S. McPherson, Agent
Central Building. Phone [illegible]
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Baltimore.
SAILINGS. Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to [illegible]

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
[illegible] Bldg. Phone [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days from Vancouver, Seattle, Portland, San Francisco and Los Angeles to New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
215 Mortgage Guarantee Bldg., [illegible] Spring St. Phone [illegible]

PASSENGERS AND FREIGHT
SAILINGS—Intercoastal.
Fortnightly [illegible] New York to Honolulu, Los Angeles and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Sailings between Los Angeles, San Francisco, Seattle, Vancouver, B. C., New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

GARLAND STEAMSHIP CORP.
[illegible]
Pacific Electric Bldg. Phone [illegible]
FREIGHT ONLY.
SAILINGS—[illegible]

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
[illegible] Bldg. Phone [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles

LUCKENBACH LINES
Luckenbach Steamship Company.
[illegible] West Eighth street. Phone Main 808.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston
SAILINGS—Gulf Service.
Every 14 days from Vancouver, Seattle, Portland, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
Lane Mortgage Bldg. Phone Metropolitan 624[illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

PACIFIC MAIL STEAMSHIP CO.
Passenger Offices: 503 South Spring street.
Freight Offices: 105 West Sixth street.
SAILINGS—Passengers and Freight.
Every 28 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York, outward calls: New York, Baltimore, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Los Angeles and San Francisco.
SAILINGS—Direct Freight Service.
Every 7 days. Fortnightly calls: San Francisco, Los Angeles, Manzanillo, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York, outward calls: New York, Baltimore, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Los Angeles and San Francisco.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
488 Pacific Electric Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA-PACIFIC LINE
International Mercantile Marine Company.
Freight Offices: Pacific Steamship Company, 322 Citizens National Bank.
Passenger Offices: 714 South Spring street, Phone [illegible]
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
(Transmarine Corporation)
G. T. Darrell
A. G. Barr
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between [illegible]

UNITED AMERICAN LINES, INC.
Los Angeles [illegible]
FREIGHT ONLY.
SAILINGS. [illegible] San Francisco.

WILLIAMS LINE
Williams Steamship Co.
Stock Exchange Bldg.
FREIGHT ONLY.
SAILINGS—Intercoastal.
[illegible] San Francisco, Oakland, Portland, Seattle, Tacoma, New York, Philadelphia, Norfolk and Baltimore.

C. O. BURGIN
C. O. Burgin has been appointed general freight agent for the intercoastal service of the Pacific Mail Steamship Company, with headquarters at 508 California street, San Francisco. Mr. Burgin succeeds Harry E. Stocker, who has gone to New York to take charge of the Munson Line office at that point. Mr. Burgin is well known in coast circles. He was for some time connected with the Luckenbach Steamship Company, leaving them to go with Fred Hammond, when the latter took charge of affairs for the Atlantic, Gulf & Pacific Line. Mr. Burgin joined the Pacific Mail staff in January of this year.

HARTMAN PASSES
John W. Hartman, 67 years of age, a veteran marine engineer well known in Pacific Coast ports, died June 19 at the Sailors' Rest Mission at Los Angeles Harbor. Death was due to apoplexy. Hartman has a sister, Mrs. Julia Sanborn, living in Pico, California.

JOINS DOLLAR STAFF
S. A. Oyen, formerly vice-president and general manager of the New York & Richmond Steamship Company, has been appointed general agent at New York for the Dollar Steamship Line, succeeding J. F. Schumacher, who resigned on account of illness. Oyen will have charge of Dollar affairs in all Atlantic Coast offices, including New York, Boston, Philadelphia, and Baltimore. When Mr. Schumacher was taken ill several weeks ago, M. J. Buckley went from the head office at San Francisco to New York, to take temporary charge. Mr. Buckley is returning to San Francisco.

PORT EXPERTS
The Pacific Coast Association of Port Authorities will convene at Seattle on September 3 and 4. Among the interesting topics to be discussed are: "Public Ownership and Methods of Operation of a Port," "Unification of Port Terminal Railway Facilities," "The Future of Pacific Coast Ports for Grain Exports," and "Modern Mechanical Handling Equipment for Port Terminals." Delegates to the meeting will be the guests of the Vancouver harbor commissioners on September 6 and 7, for inspection of the Improved Vancouver terminals. Colonel George Lamping, commissioner of the Port of Seattle, is president of the association, and George F. Nichols is executive secretary and chief engineer of Seattle, is secretary.

UNITED AMERICAN LINES, INC.

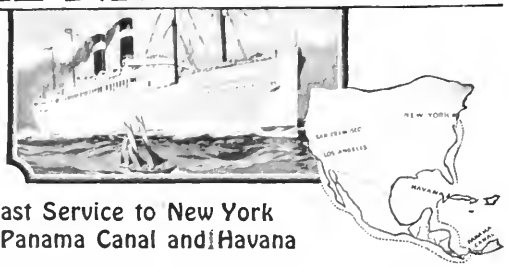
S. S. Mount Clinton—One of the Express Intercoastal Freighters

INTERCOASTAL
EVERY 10 DAYS
VIA PANAMA CANAL
Baltimore-New York
Savannah and Los Angeles
San Francisco-Oakland-Portland-Seattle-Tacoma

NORTH PACIFIC-EUROPEAN
FORTNIGHTLY SERVICE
PASSENGERS and FREIGHT
Between North Pacific Ports
and
United Kingdom-Continent via Los Angeles

SUDDEN & CHRISTENSON, General Agents for Pacific Coast
T. H. JACOBS, General Passenger Agent, 230 California Street, San Francisco
Sudden & Christenson, 612 Arctic Club Bldg., SEATTLE — Los Angeles SS Co., 407 Central Bldg., LOS ANGELES
Sudden & Christenson, 616 Puget Sound Bank Bldg., TACOMA — Columbia Pacific Shipping Co., Porter Bldg., PORTLAND
ATLANTIC COAST AGENTS
UNITED AMERICAN LINES, INC.

THE NEW WAY EAST



Fast Service to New York
via Panama Canal and Havana

Regular Dependable Coast to Coast Passenger and Freight Service
New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle, Tacoma

WESTBOUND From New York, Pier 61, N. River		EASTBOUND From San Francisco, Pier 22—Los Angeles Har	
FINLAND	July 3		June 28 — June 30
MANCHURIA	July 31	KROONLAND	July 12 — July 14
KROONLAND	Aug. 14	FINLAND	July 26 — July 28
FINLAND	Aug. 28	MANCHURIA	Aug. 23 — Aug. 25
MANCHURIA	Sept. 18	KROONLAND	Sept. 6 — Sept. 8
		FINLAND	Sept. 20 — Sept. 22

Direct connections at New York and thru Bills of Lading over Lines via: American Line to HAMBURG, Red Star Line to ANTWERP, Atlantic Transport Line to LONDON, White Star Line to LIVERPOOL, SOUTHAMPTON and MANCHESTER

PANAMA PACIFIC LINE

INTERNATIONAL MERCANTILE MARINE COMPANY

Passenger Offices:
T. H. LARKE—Pacific Coast Manager
SEATTLE, 619 Second Ave. — SAN FRANCISCO, 550 Market St. — LOS ANGELES, 510 South Spring St.

PACIFIC STEAMSHIP CO. (The Admiral Line), General Freight Agents Pacific Coast
SAN FRANCISCO, 60 California St. — LOS ANGELES, 322 Citizens National Bank — SEATTLE, L. C. Smith Bldg. — PORTLAND, Admiral Line Terminal

INTERCOASTAL

PORTLAND

AMERICAN-HAWAIIAN S. S. CO.

C. D. Kennedy, agent.
Railway Exchange Building.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE

Norton, Lilly & Company, general agents.
400 Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Portland, New York, Boston, Providence, Philadelphia and Baltimore.

ISTHMIAN STEAMSHIP LINES

Nortoo, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES

Luckenbach Steamship Company, Inc.
Spalding Building. Phone Broadway 4870.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 14 days from Vancouver, Seattle, Tacoma, Portland, San Francisco, Oakland, and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE

McCormick Steamship Company.
181 Burnside street. Phone Broadway 1494.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland and Seattle.

PACIFIC MAIL STEAMSHIP CO.

Norton, Lilly & Company, general agents.
Yeon Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days from Seattle and San Francisco to Los Angeles, San Pedro, Long Beach, Wilmington, Los Angeles, San Diego, Portland and Seattle.

PACIFIC-CARIBBEAN GULF LINE

Swayne & Hoyt, Inc., agents.
1005 Stinson Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and other Texas and Gulf of Mexico ports as shipments offer, via Panama Canal.

PANAMA PACIFIC LINE

Intercoastal Steamship Company.
Pacific Steamship Company, freight agents.
Admiral Line Terminal.
SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

UNITED AMERICAN LINES, INC.

California Shipping Company, agents.
Porter Building. Phone Main 3360.
FREIGHT ONLY
SAILINGS—Weekly between New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Oakland and Portland.

VANCOUVER

ARGONAUT STEAMSHIP LINE

B. W. Greer & Co., Ltd.
[illegible] West. Phone [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 5 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Ke[illegible], Pacific Coast [illegible]
Phone Seymour [illegible]
FREIGHT ONLY.
SAILINGS—Every [illegible] Montreal. The [illegible] other Pacific Coast ports.

DOLLAR STEAMSHIP LINE

Canadian Robert Dollar Co., Ltd.
402 Hastings West. Phone Seymour 8680.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings [illegible] Vancouver, B. C., Seattle, Tacoma, Portland, San Francisco, Los Angeles, San Diego and New York. Boston, Providence, Philadelphia and Baltimore.

ISTHMIAN STEAMSHIP LINES

B. W. Greer & Co., Ltd.
602 Hastings West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal Service
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES

Pacific Steamship Company, Inc.
Seymour [illegible].
FREIGHT ONLY.
SAILINGS—North Atlantic-Inter[illegible]
[illegible]
SAILINGS—Gulf [illegible]

MUNSON-McCORMICK LINE

McCormick Steamship Company, Ltd.
Hastings [illegible]
FREIGHT ONLY
SAILINGS—Intercoastal
[illegible] New York, Baltimore, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARIBBEAN GULF LINE

[illegible]
FREIGHT ONLY
SAILINGS—[illegible] Gulf ports.

ORIENTAL

SAN FRANCISCO

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

Dodwell & Company, Ltd.
2 Pine street. Phone Sutter 4[illegible]
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, Manila [illegible] ports, connecting via [illegible] Line.

DOLLAR STEAMSHIP LINE

The Robert Dollar Co.

[illegible]

PASSENGER AND FREIGHT
SAILINGS—[illegible]

FREIGHT ONLY
SAILINGS—[illegible]

DE LAVAL

De Laval Steam Turbine Company has formed a Pacific Coast sales organization covering the states of California, Oregon, Washington, and parts of the adjoining states under the direction of William Pullen, with offices in San Francisco, Los Angeles, and Seattle. The Los Angeles district office will be at 312 Union Oil building, 617 West Seventh street, in charge of Ivan H. Goodner, an engineer of broad experience in power and irrigation development. The San Francisco headquarters and district office, center of Mr. Pullen's territory, is at 531 Rialto building. In this office also will be Eck Baughn, assistant to Mr. Pullen, another widely experienced power and pump expert, and Charles P. Markley, a mechanical authority for the De Laval general plant. In Seattle the office is 1306-7 L. C. Smith building, in charge of James Q. Osborne, assisted by F. A. Hurlbut. These representatives are all well qualified to give information and efficient service in connection with De Laval products. The De Laval Steam Turbine Company works and general headquarters are at Trenton, New Jersey, and the firm produces steam turbines, double helical speed reducing gears, centrifugal blowers, and compressors, turbo generators, single, and multistage centrifugal pumps, hydraulic turbines, flexible couplings, and special centrifugal machinery.

PIRRIE DEAD

Viscount Pirrie, 73, head of the firm of Harland & Wolff, famous shipbuilders of Belfast, Ireland, died June 7 of pneumonia aboard the steamer Ebro while en route to England from South America. William James Pirrie, master shipbuilder of the British Empire, was born of Irish parents at Quebec in 1847. When a baby he was taken to Belfast and later went to private schools there, and to the Belfast Royal Academic Institute. When fifteen years old he became a premium apprentice with the Harland & Wolff plant, only 100 men being employed there then. The head of the firm, Sir Edward Harland, in a short while, saw that the young apprentice had the makings of a great shipbuilder, so he advanced him rapidly. When the Queen was launched Pirrie was chief draughtsman. Five years later, when only 25 years old, he left the shipyard to become a partner in a firm that was to become famous. During the World War Viscount Pirrie was controller general of merchant shipping.

ORIENTAL

MITSUI & COMPANY, LTD.
(Mitsui Bussan Kaisha, Ltd.)
Merchants Exchange Bldg. Phone Sutter 3414.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NIPPON YUSEN KAISHA
Dodwell & Company, Ltd.
2 Pine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Regular service between China, Japan ports and United States Atlantic ports via Panama Canal, vessels calling at San Francisco on both outward and homeward voyages. One arrival monthly from Japan, discharging cargo at San Francisco. One to two sailings monthly homeward, occasionally loading cargo for Yokohama, Kobe and Shanghai.

OSAKA SHOSEN KAISHA
McCormick, McPherson & Lapham.
503 Market street. Phone Kearny 3632.
SAILINGS—San Francisco Service (FREIGHT ONLY).
Monthly service to and from Yokohama, Kobe, Moji, Shanghai, Hongkong and Singapore.
SAILINGS—Los Angeles Service (PASSENGERS AND FREIGHT)
A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, the Panama Canal and Los Angeles.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3800.
(Operating U. S. S. B. vessels.)
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific Service.
Every 14 days from San Francisco to Honolulu, Yokohama, Kobe, Shanghai, Manila and Hongkong.
SAILINGS—Hongkong-India (Freight Only.)
Connection at Hongkong every 2 weeks for India ports.

STRUTHERS & BARRY
(Operating U. S. S. B. vessels.)
112 Market street. Phone Sutter 7640.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular intervals from Los Angeles, San San Francisco, thence direct to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Darien, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA
(Oriental Steamship Company, Ltd.)
549-51 Market street. Phone Sutter 3960
PASSENGERS AND FREIGHT.
SAILINGS—Twice a month between San Francisco, Honolulu, Yokohama, Kobe, Nagasaki, Shanghai and Hongkong.
SAILINGS—Monthly to China and Japan on steamers from the West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

YAMASHITA KISEN KOGYO KAISHA
Yamashita Company, Inc., agents.
222 Robert Dollar Bldg. Phone Garfield 3899.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

SEATTLE

ADMIRAL ORIENTAL LINE
L. C. Smith Building. Phone Elliott 2085.
SAILINGS—PASSENGERS AND FREIGHT.
Every 12 days between Seattle, Victoria, B. C., Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—FREIGHT ONLY.
Regular service to Vladivostok, Dairen, Tientsin, Tabu Bar, Tsingtao, Shanghai and Japan ports on either outward or homeward voyages, as freight offers justify direct call.
SAILINGS—Monthly service to Yokohama, Kobe, Shanghai, Foochow, Amoy, Swatow, Manila, Cebu and Iloilo.

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., agents.
Stuart Building. Phone Elliott 6147
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, agents.
L. C. Smith Building. Phone Elliott 0794.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular sailings North Pacific Coast ports to Shanghai, Kobe, Hongkong and Manila, returning via Los Angeles and San Francisco.

R. T. JOHNS & COMPANY
R. T. Johns & Company, agents.
Central Building. Phone Elliott 7697.
FREIGHT ONLY.
SAILINGS—Tramp service between Seattle and Oriental ports of Yokohama, Kobe, Nagoya, Shimidzu and Moji.

MITSUI & COMPANY, LTD.
(Mitsui Bussan Kaisha, Ltd.)
American Bank Building. Phone Elliott 1450.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco, Portland, Seattle and Puget Sound ports, thence to China and Japan.

NIPPON YUSEN KAISHA
Colman Building. Phone Elliott 3514.
PASSENGERS AND FREIGHT.
SAILINGS—Frequent intervals, calling at Victoria or Vancouver, B. C., Yokomama, Kobe, Nagasaki, Shanghai, Hongkong or other Oriental ports as inducements offer.

OSAKA SHOSEN KAISHA
W. C. Dawson & Company, agents.
Mutual Life Building. Phone Elliott 0842
PASSENGERS AND FREIGHT.
SAILINGS—Regular fortnightly service to Yokohama, Kobe, Moji, Dairen, Shanghai, Manila and Hongkong

SUZUKI & COMPANY
Colman Building. Phone Main 7581.
FREIGHT ONLY.
SAILINGS—Irregular service between Seattle and Japanese ports.

THORNDYKE-TRENHOLME CO.
L. C. Smith Building. Phone Main 3265.
FREIGHT ONLY.
SAILINGS—Regular service between Puget Sound, Grays Harbor, Astoria and Portland, Kobe, Osaka and Nagoya.

WALKER-ROSS, INC.
L. C. Smith Building. Phone Main 7574.
FREIGHT ONLY.
SAILINGS—Regular service between Seattle and Yokohama, Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO KAISHA
Yamashita Company, Inc., agents.
Central Building.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Seattle to Yokohama, Kobe, Osaka and Nagoya.

LOS ANGELES

CANADIAN GOVERNMENT MERCHANT MARINE
Dodwell & Company.
412 [illegible] Phone [illegible]
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly sailings over to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.

DOLLAR STEAMSHIP LINE
212 Merchants Exchange Building. Phone Main 0131.
PASSENGERS AND FREIGHT
SAILINGS [illegible]
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings from Los Angeles and San Francisco via Honolulu to Yokohama, Kobe, Shanghai, Hongkong and Manila.

OSAKA SHOSEN KAISHA
McCormick, McPherson & Lapham.
Central Building.
PASSENGERS AND FREIGHT.
SAILINGS—A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong.

LIVINGSTON DEAD

IN the death of John Livingston, the dean of marine underwriters, in San Francisco, marine insurance circles lost an associate the like of whom will probably never again appear on the "street." Livingston died in Oakland on June 12, after having been in the marine insurance business in San Francisco for approximately a half century.

Among his associates John Livingston enjoyed an enviable reputation, built up through his high standard of business integrity from the moment he set foot on San Francisco soil from the good ship Duke of Edinborough in the early sixties. In his calling his advice was sought by all. He knew the marine insurance business from the ground up, and with the kindness and generosity which marked his entire life he gave of it freely.

Beginning his career in a Liverpool shipping office, Mr. Livingston migrated to Australia and then to San Francisco, where he organized the shipping and commission firm of Lowenthal, Livingston & Company. The marine general agency of the Maritimes Insurance Company was obtained by this firm. Later, when the company dissolved, Mr. Livingston took over the Maritimes Insurance Company agency.

In 1896 Mr. Livingston and H. Stephenson Smith formed a partnership to handle the Maritime. The Western Assurance Company was later added. The partnership was dissolved in 1912 and Livingston again did the marine underwriting for the Maritime Insurance Company.

The report of the annual meeting of the Tokio Marine & Fire Insurance, held in Tokio on April 1, has just reached San Francisco and tells an interesting story of the effect of the earthquake in Japan last September on the largest of the Japanese marine and fire insurance companies. After stating that the losses of the company were very heavy owing to its large commitments, the report makes the following statement in regard to marine losses:

"The gross losses sustained on sunk and burned interests in the devastated areas amounted to over 5,000,000 yen, a portion of which has been settled in the current year and an ample amount has been apportioned to the underwriting expense account to meet all outstanding future claims under 1923 and the previous years' policies."

ORIENTAL

Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their home-bound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, Panama Canal and Los Angeles.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels.)
701-02 Transportation Bldg. Phone Tucker 5960.
FREIGHT ONLY.
SAILINGS—Regular intervals from Los Angeles and San Francisco, thence to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Dairen, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
S. L. Kreider, agent.
375 Pacific Electric Bldg. Phone TRinity 6550.
PASSENGERS AND FREIGHT.
SAILINGS—Regular to China and Japan via San Francisco, on steamers of Japan, Hongkong, San Francisco line.
SAILINGS—Monthly to Oriental ports via San Francisco on steamers from West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

PORTLAND

AMERICAN ORIENTAL SERVICE

A. M. Gillespie, Inc., agents.
Board of Trade Bldg. Phone Broadway 4324.
SAILINGS—Monthly from ports of Japan and China as inducements offer.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
702 Wilcox Building. Phone Main 4113.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NORTH CHINA LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Taku Bar and Dairen.

PORTLAND-ORIENT LINE

Wallen & Co., agents.
Porter Building. Phone Broadway 1844.
SAILINGS—From Portland to Yokohama, Kobe, Shanghai, Tsingtao, Taku Bar, Dairen, Vladivostok.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
Oregon-Pacific Company, agents.
203-4 Wilcox Building. Phone Bdwy. 4529.
FREIGHT ONLY.
SAILINGS—Monthly from Portland to Oriental ports.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

SOUTH CHINA LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Broadway 5360.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Portland to Yokohama, Kobe, Hongkong and Manila.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company.
1109 Porter Building.
FREIGHT ONLY.

SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Yorkshire Building. Phone Seymour [illegible].
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.

CANADIAN PACIFIC STEAMSHIPS, LTD.

Canadian Pacific Railway Station. Phone Seymour 2630.
PASSENGERS AND FREIGHT.

DOLLAR STEAMSHIP LINE

Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings from North Pacific ports to Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles and San Francisco.

FURNESS PRINCE LINE

Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
1312 Standard Bank Building.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Vancouver to Yokohama, Kobe, Shanghai and Hongkong.

NIPPON YUSEN KAISHA

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Vancouver and ports in Japan, China and Philippines.

OSAKA SHOSEN KAISHA

Empire Shipping Company, Ltd.
815 Hastings St., W. Phone Seymour 8014.
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks to all ports in Japan and China, also Vladivostok, Singapore, Bombay, etc.

SUZUKI & COMPANY

B. L. Johnson Walton & Company.
[illegible] Hastings street, W. [illegible]
FREIGHT ONLY.
SAILINGS—Irregular service between Pacific Coast ports and Japan ports.

WALKER-ROSS, INC.

Canadian American Shipping Company, Ltd.
Phone Seymour 2598.
FREIGHT ONLY.
SAILINGS—Regular service to Yokohama, Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO KAISHA

[illegible]
FREIGHT ONLY.
SAILINGS—Every 2 weeks to Yokohama, Kobe, Osaka and Nagoya.

UNITED KINGDOM—CONTINENTAL EUROPE

SAN FRANCISCO

BLUE FUNNEL LINE

Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.
2 Fine street. Phone Sutter 4261.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Ltd.
433 California [illegible]
PASSENGERS AND FREIGHT.
SAILINGS—[illegible]

ELLERMAN'S WILSON LINE, LTD.

Norton, Lilly & Company, general agents.
[illegible]
FREIGHT ONLY.

MARINE INSURANCE

(Continued from Page 389)

serious matter. Classification societies make very strict rules regarding the standard and upkeep of pumps and auxiliary machinery of all kinds.

Fire Detection

One of the greatest hazards which confront the marine underwriter is fire, and he is keenly alive to any device which has for its purpose the detection or extinguishing of this agency of destruction. Many systems are in use on shipboard today which have been highly successful in reducing the loss by fire. The dry sprinkler system has been installed on a large number of vessels, and is so controlled as to prevent the operation of the system unless a fire actually occurs, thus avoiding damage to cargo through an accidental breakage of the pipe or sprinkler head.

The fire detection systems in use operate either through the expansion of air by heat, smoke collectors, or the automatic setting-off of alarms by heat. All of these systems are so constructed as to allow of gas or steam being injected into the hold where the fire has broken out. Many underwriters are privately interested in the financing of certain of these systems, appreciating their value to shipping.

Stabilization

"Shifting of cargo" is a term of extreme significance to the underwriter. It usually denotes the basis for a claim on the ground of heavy weather. The rolling of a ship in great seas frequently causes the cargo to shift, resulting in serious damage through breakage and crushing of packages. The gyro-stabilizer, if it lives up to the predictions of its inventors, should effect a great saving to underwriters through the elimination of cargo-shifting claims. To date, the device has been reported as somewhat successful in reducing the rolling of a vessel.

The past few years have witnessed a greater reliance than ever before on a ship's anchors in salvage operations, and with the increased knowledge of proper methods in getting a vessel off the strand comes a demand for a type of anchor chain and windlass that will meet the severe tests to which a vessel's gear is put when emergency arrises. Many ships have been saved from total loss through a knowledge of the proper use of anchors, but the salvage of the vessels would have been impossible without the modern windlass

UNITED KINGDOM---CONTINENTAL EUROPE

SAILINGS—Service between Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation, agents
240 Battery street. Phone Kearny 4160.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
710 Balfour Building. Phone Sutter 6478-6479.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports when inducements offer.

GENERAL STEAMSHIP CORP.
240 Battery street. Phone Kearny 4160.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
351 California street. Phone Sutter 6437.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
E. C. Evans & Sons, agents.
260 California street. Phone Douglas 8640-1-2.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
W. R. Grace & Co., general agents
332 Pine street. Phone Sutter 3700
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Royal Mail Steam Packet Company and Holland America Line.)
401 Market street. Phone Douglas 7510.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam.

NORWAY PACIFIC LINE
465 California street. Phone Sutter 3170.
FREIGHT ONLY.
SAILINGS—From San Francisco and Los Angeles to United Kingdom Continental ports and Scandinavian ports.

PACIFIC EUROPEAN LINE
Parke Aitken & Company, general agents.
110 California street. Phone Douglas 7510.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco, Los Angeles, United Kingdom, Continental ports.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]
San Francisco.

UNITED AMERICAN LINES, INC.
[illegible]
230 California street. Phone Douglas 2345.
Pier [illegible]
PASSENGERS AND FREIGHT
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SEATTLE

BLUE FUNNEL LINE
Dodwell & Company, Ltd., agents.
Stuart Building. Phone Elliott 247.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.
The East Asiatic Company [illegible]
823 Alaska Building. Phone Elliott 2445.
PASSENGERS AND FREIGHT
SAILINGS—Regular service [illegible] ports direct to Hamburg, Bremen, Rotterdam and Scandinavian ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agent.
Alaska Building. Phone Elliott 2445.
FREIGHT ONLY.
SAILINGS—Service between Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation, agents.
Colman Building. Phone Elliott 5776.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness, Withy & Company Ltd.)
Furness (Pacific), Ltd.
Colman Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
Colman Building. Phone Elliott 5776.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company, agents.
Stuart Building. Phone Elliott 1444.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company.
Alaska Building. Phone Elliott 2445.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles, San Diego and [illegible] to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
W. R. Grace & Company, [illegible]
Hoge Bldg.
PASSENGERS AND FREIGHT.
SAILINGS—[illegible]

NORTH PACIFIC COAST LINE
[illegible]
Colman Building. Phone Elliott 2445.
PASSENGERS AND FREIGHT.
SAILINGS—[illegible] weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam.

PACIFIC EUROPEAN LINE
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]
San Francisco.

UNITED AMERICAN LINES, INC.
[illegible]
PASSENGERS AND FREIGHT
SAILINGS—North Pacific-European Service. [illegible] ports and ports in United Kingdom and Continental Europe.

which permits of prompt paying out and hauling in on the anchors.

Signalling Devices

Submarine signalling devices, as used on buoys, lightships and vessels, operate by means of a bell located below the water line, the water acting as a conductor of the sound. The receiving vessel is equipped with apparatus which permits not alone of determining the direction of the sound, but also the distance of the transmitting object. Submarine bells on buoys are operated by the motion of the water, while on vessels they depend upon electric power. As an aid in preventing collision or stranding in fog or darkness, the submarine signal systems are of great value to shipping and undoubtedly serve to keep down the loss records of steamship lines.

The radio compass, which is a development of the world war, offers great possibilities in preventing strandings and collisions when vessels are approaching the coast in the fog or darkness. Nor does it require a great stretch of the imagination in these days of tremendous advancement in knowledge of the use of the radio to visualize the time when the radio compass will play a great part in guiding vessels far out at sea. At the present time the error in the bearings is very slight, even at distances of several hundreds of miles. An invention of this character must have an important influence in reducing casualties and effecting a compensating reduction in the insurance rate.

The direction cable, while not in very general use as yet, offers a means of aiding a vessel to enter a narrow or congested harbor in a fog without danger of collision or stranding. This cable, which is connected at one end to the shore and runs under the channel to the entrance of the harbor, where it is fastened to a plate, enables a vessel to know at all times that it is following the channel.

In conclusion, it ought not be amiss to call attention to the fact that marine insurance rates are not built up as are those of life insurance. There are no standard tariffs in marine insurance, but a schedule providing allowances for certain equipment, or penalty for its absence. The rates are based on experience, and each fleet is rated according to the experience of underwriters with that fleet, subject, of course, to competition, which sometimes forces rates out of line with the real value of the risk.

UNITED KINGDOM---CONTINENTAL EUROPE

SAILINGS—Service between Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports, via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation, subagents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
710 Balfour Building. Phone Sutter 6478-6479.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports when inducements offer.

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
351 California street. Phone Sutter 6437.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES

E. C. Evans & Sons, agents.
260 California street. Phone Douglas 8040-1-2.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Co., general agents.
312 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint service of the Royal Mail Steam Packet Company and Holland American Line.)
401 Market street. Phone Douglas 7510.
PASSENGERS AND FREIGHT
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

NORWAY PACIFIC LINE

485 California street. Phone Sutter 5700.
FREIGHT ONLY.
SAILINGS—From San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavian ports.

PACIFIC EUROPEAN LINE

Parke Ashburr & Co., Inc., Coast agents.
110 California street. Phone Douglas 167.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco, Los Angeles and United Kingdom and Continental ports.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
[illegible]
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Marseilles and other Mediterranean ports.

UNITED AMERICAN LINES, INC.

Stuart & Cummings, Pacific Coast Agents.
230 California street. Phone Garfield 2846.
For sailings see Havre Service.
PASSENGERS AND FREIGHT
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.
823 Alaska Building. Phone Elliott 2442.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, [illegible] ports direct to Hamburg, Hull, Antwerp, Copenhagen, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Service between Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation.
Colman Building. Phone Elliott 3706.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

(Furness, Withy & Company Ltd.)
Furness (Pacific) Ltd.
705 Arctic Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 3706.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company, agents.
Stuart Building. Phone Elliott 1454.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings every 2 weeks.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Company.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint Service of the Royal Mail Steam Packet Company and Holland American Line.)
204-205 Hoge Building. Phone Elliott 2442.
PASSENGERS AND FREIGHT
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

PACIFIC EUROPEAN LINE

Parke Ashburr & Co., Inc., Coast agents.
FREIGHT ONLY.
SAILINGS—[illegible]

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]

UNITED AMERICAN LINES, INC.

Stuart & Cummings, agents.
Stuart Building.
PASSENGERS AND FREIGHT
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SEATTLE

BLUE FUNNEL LINE

Dodwell & Company, Ltd., agents.
Stuart Building. Phone Elliott 3147.
PASSENGERS AND FREIGHT.

which permits of prompt paying out and hauling in on the anchors.

Signalling Devices

Submarine signalling devices, as used on buoys, lightships and vessels, operate by means of a bell located below the water line, the water acting as a conductor of the sound. The receiving vessel is equipped with apparatus which permits not alone of determining the direction of the sound, but also the distance of the transmitting object. Submarine bells on buoys are operated by the motion of the water, while on vessels they depend upon electric power. As an aid in preventing collision or stranding in fog or darkness, the submarine signal systems are of great value to shipping and undoubtedly serve to keep down the loss records of steamship lines.

The radio compass, which is a development of the world war, offers great possibilities in preventing strandings and collisions when vessels are approaching the coast in the fog or darkness. Nor does it require a great stretch of the imagination in these days of tremendous advancement in knowledge of the use of the radio to visualize the time when the radio compass will play a great part in guiding vessels far out at sea. At the present time the error in the bearings is very slight, even at distances of several hundreds of miles. An invention of this character must have an important influence in reducing casualties and effecting a compensating reduction in the insurance rate.

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In conclusion, it might not be amiss to call attention to the fact that marine insurance rates are not built up as are those of fire insurance. There are no standard tariffs in marine insurance, nor schedules providing allowances for certain equipment, or penalty for its absence. The rates are based on experience, and each fleet is rated according to the experience of underwriters with that fleet, subject, of course, to competition, which sometimes forces rates out of line with the real value of the risk.

UNITED KINGDOM---CONTINENTAL EUROPE

LOS ANGELES

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company.)
Dodwell & Company, Ltd.
412 Union Oil Building. Phone Broadway 7900 and Vandike 4944.
FREIGHT ONLY.
SAILINGS—Every 6 weeks from North Pacific Coast ports, including San Francisco and Los Angeles to London, Liverpool and Glasgow via Panama Canal.

EAST ASIATIC COMPANY, LTD.
Balfour, Guthrie & Company, agents.
315 Union Oil Bldg. Phone SU-7134.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
S. L. Kreider, agent.
375 Pacific Electric Bldg. Phone TRinity 6556.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness Withy & Company, Ltd.)
Swayne & Hoyt, Inc., agents.
488 Pacific Electric Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco, Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
S. L. Kreider, agent.
Pacific Electric Bldg. Phone Pico 6050 Bdy. 23.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
315 Union Oil Building. Phone 7865
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
H. R. & M. F. McLaurin, Inc.
406 South Main street. Phone Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Europe, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Holland-America Line and Royal Mail Steam Packet Co.)
C. J. Lehman, agent.
123 E. Sixth street. Phone Trinity 5171.
PASSENGERS AND FREIGHT.
SAILINGS—Every 4 weeks between Vancouver, Seattle, Portland, Astoria, San Francisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

NORWAY PACIFIC LINE
703 Palos Verdes street, San Pedro.
FREIGHT ONLY.
SAILINGS—Four motor-ships operating from San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia. Sailings every 30 days.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Service from Vancouver, Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducement offer.

UNITED AMERICAN LINES, INC.
Los Angeles S. S. Company, agents.
407 Central Building.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

PORTLAND

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.)
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles and London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.
Chalmers & Cartwright, Inc., agents.
Porter Building. Phone Broadway 4152.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
(General Steamship Corporation.)
Porter Building. Phone Broadway 6714.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
708 Spalding Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
Porter Building. Phone Broadway 7234
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
355 Oak street. Phone Bdwy. 360
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2 61.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
Liddell & Clark, agents.
305 Pittock Block.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Europe, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Holland-America Line and Royal Mail Steam Packet Co.)
Oregon Pacific Building.
205 Wells Fargo Building.
PASSENGERS AND FREIGHT.
SAILINGS—Every 4 weeks between Vancouver, Seattle, Portland, Astoria, San Francisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

MATSON BIDDERS

A group of widely known construction experts of the East have been in San Francisco in connection with the bidding for the new Matson liner to cost $6,000,000, which is to operate between San Francisco and Hawaii. Homer Ferguson, president of the Newport News Shipbuilding Company, was on hand to present the bid of his firm. William Dobson, naval architect, and J. F. Metten, chief engineer, for William Cramp & Sons, were present in interests of that organization. Four representatives of the Bethlehem Shipbuilding Corporation, Hugo P. Frear, chief naval architect, B. Warnier, chief engineer, H. G. Smith, vice-president in charge of sales, and E. F. Schultz, chief estimator, jointly submitted the Bethlehem plan.

WOODEN HULLS

Captain J. C. Brownfield and associates of Seattle have bought twenty-nine vessels, the entire idle fleet of former Shipping Board wooden hulls, which have been lying in Lake Union, Seattle, since shortly after the close of the world war, from the Equitable Transportation Company of San Francisco. The price was not made public. The vessels will be converted into barges and various floating plants, such as storage ships, salmon canneries, and fish-oil reduction units.

ROUND-THE-WORLD

SAN FRANCISCO

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street.
Pacific Coast 43[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly between San Francisco, Honolulu, Kobe, Shanghai, Hongkong, Manila, Singapore, Penang, Colombo, Port Said, Naples, Genoa, Nice, Cannes, Marseilles, Boston, New York, Havana, [illegible]
FREIGHT ONLY.
REGULAR SAILINGS—[illegible] San [illegible] [illegible] Hong [illegible] Manila [illegible] Singapore [illegible] Colombo [illegible] Port Said [illegible] Naples [illegible] Genoa [illegible] Marseilles [illegible] Boston [illegible] New York [illegible] Havana [illegible]

LOS ANGELES

DOLLAR STEAMSHIP LINE
[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—[illegible] [illegible] Hong [illegible] Manila [illegible] Singapore [illegible] Colombo [illegible] Port Said [illegible] Naples [illegible] Genoa [illegible] Marseilles [illegible] Boston [illegible] New York [illegible] Havana [illegible]
FREIGHT ONLY.
REGULAR SAILINGS—[illegible] San [illegible] [illegible] Hong [illegible] Manila [illegible] Singapore [illegible] Colombo [illegible] Port Said [illegible] Naples [illegible] Genoa [illegible] Marseilles [illegible] Boston [illegible] New York [illegible] Havana [illegible]

UNITED KINGDOM---CONTINENTAL EUROPE

cisco and L. Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

PACIFIC EUROPEAN LINE
Stetter & Co., agents.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco and United Kingdom and Continental Europe.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—From Seattle, Portland, San Francisco and L. Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.
Columbia Pacific Shipping Company, agents.
Porter Building. Phone Broadway 5500.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service.
Fortnightly between North Pacific ports and and ports in United Kingdom and Continental Europe.

VANCOUVER

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., agents.
Yorkshire Building. Seymour 6576.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks from N. Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keefe, Pacific Coast manager.
Phone Seymour 8430.
FREIGHT ONLY.
SAILINGS Monthly to Avonmouth via Panama.

EAST ASIATIC COMPANY, LTD.
B. L. Johnson, Western Canadian Agents.
837 Hastings street. Phone Seymour 7347.
PASSENGERS AND FREIGHT.
SAILINGS—Regular sailings Pacific Coast ports, direct to Harwich, Hull, Gothenburg, Copenhagen, with transshipment to all Scandinavian Baltic ports.

ELLERMAN'S WILSON LINE
B. W. Greer & Son, Ltd.
603 Hastings street, West. Phone Seymour 2377.
FREIGHT ONLY
SAILINGS—Regular sailings from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment to Hull.

FRENCH LINE
Compagnie Generale Transatlantique.)
Empire Shipping Co., Ltd. Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver to Bordeaux, Havre, Antwerp and Hamburg.

FURNESS LINE
Furness Withy & Company, Ltd.
Furness (Pacific), Ltd.
1111 Standard Bank Building.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Vancouver and other Pacific Coast ports to United Kingdom.

GENERAL STEAMSHIP CORP.
Empire Shipping Co., Ltd., 61 Historic St., W.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—From Pacific Coast ports to United Kingdom and Scandinavia, as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company, Ltd.
Phone Seymour 7080.
FREIGHT ONLY.
SAILINGS Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December, inclusive.

ISTHMIAN STEAMSHIP LINES
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
SAILINGS—Intercoastal Service
SAILINGS—Pacific-United Kingdom Service.
Every 30 days from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
Gardner Johnson & Company, Ltd.
Metropolitan Building. Phone Seymour 357.
PASSENGERS AND FREIGHT.
SAILINGS Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of The Royal Mail Steam Packet Co. and Hind Rolph & Co.)
Rolph-Scandinavian Packet Company, agents.
Pacific Building. Phone Seymour 7100.
PASSENGERS AND FREIGHT
SAILINGS—Regular services between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

PACIFIC EUROPEAN LINE
Stetter & Co., agents. Shipping Commissioners.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco, Los Angeles and United Kingdom and Continental Europe.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight.
Twice a month between San Francisco, Los Angeles, calling at ports on West Coast of Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Puita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, and Taltal. (Other ports as inducements offer.)

TOYO KISEN KAISHA
(Oriental Steamship Company.)
549-551 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via Honolulu.

Mexico---Central America--Canal Zone---South America

SAN FRANCISCO

GENERAL STEAMSHIP CORP.
240 Battery street. Phone Kearny 4100.
PASSENGERS AND FREIGHT
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE
W. R. Grace & Company, general agents.
332 Pine street. Phone Kearny 2700.
PASSENGERS AND FREIGHT
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports of Peru and Chile as inducements offer.

LATIN-AMERICA LINE
R. S. Schwerin & Co., general agents.
346 Sansome street. Phone Kearny 2512.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Seattle, Seattle and San Francisco to principal West Coast of Mexico ports as far south as Balboa.
SAILINGS—Pacific Coast South America.
Monthly from Seattle, Portland, San Francisco to principal West Coast ports of South America as far south as Valparaiso.

McCORMICK STEAMSHIP CO.
215 Market street.
PASSENGERS AND FREIGHT
SAILINGS—Every [illegible] from San Francisco to San Luis Obispo, La Paz, Guaymas, Topolabampo, Mazatlan, San Blas and Manzanillo.

MEXICAN FREE PORTS S. S. LINE
Williams, Dimond & Company, S. F. Agts.
320 Sansome street. Phone Sutter 7400.
PASSENGERS AND FREIGHT.
SAILINGS Every 30 days from San Francisco and Los Angeles to the West Coast of Mexico.

MEXICAN STATES LINE
Williams, Dimond & Company.
320 Sansome street. Phone Sutter 7400.
PASSENGERS AND FREIGHT.
SAILINGS—Every 8 days from San Francisco and Los Angeles to West Coast of Mexico, Central America.

PACIFIC LINE
The Pacific Steam Navigation Company.
550 Market street. Phone Sutter 4632.
PASSENGERS AND FREIGHT.
SAILINGS—From San Francisco, Panama Canal, Guaymas, Cal., Mollendo, Arica, Iquique, Antofagasta, Valparaiso, Talcahuano, Corral; also to Havana and New York; also via Australia and Havana to Spain, France and England. Steamers connect at Panama for South and Central America.

PAC.-ARGENTINE-BRAZIL LINE
(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
430 Sansome street. Phone Kearny 2600.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles, via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

SEATTLE

GENERAL STEAMSHIP CORP.
Colman Building. Phone Elliott 5706.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE
W. R. Grace & Company, agents.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports of Peru and Chile as inducements offer.

LATIN AMERICA LINE
Lea Mathews Shipping Corporation.
Alaska Building. Phone Elliott 4567.
FREIGHT ONLY.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Seattle, Portland and San Francisco to all ports on West Coast of Mexico, and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Seattle, Portland and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

PAC.-ARGENTINE-BRAZIL LINE
(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc.
Lobby No. 4, Central Bldg. Phone Elliott 6383.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PAN-PACIFIC LINE
Norton, Lilly & Company, general agents.
Washington Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta and Taltal. (Other ports as inducements offer.)

LOS ANGELES

GENERAL STEAMSHIP CORP.
S. L. Kreider
327 Pacific Electric Bldg. Phone TRinity 6556.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE
H. R. & M. F. McLaurin, Inc.
406 South Main street. Phone Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports in Peru and Chile as inducements offer.

MEXICAN FREE PORTS S. S. LINE
Wheaton & Krueger. 621 Chapman Building.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to West Coast of Mexico.

MEXICAN STATES LINE
Wheaton & Krueger.
621 Chapman Building.
PASSENGERS AND FREIGHT.

FREIGHTS AND CHARTERS

SINCE our last report, dated May 14, there has been very little business done in full cargo freights from the Pacific Coast, and judging from reports received from foreign correspondents, the same quiet conditions rule in all other markets and the outlook for the immediate future is anything but promising.

There is practically no call for wheat space from the North for the United Kingdom and Continent, the rates being nominally 32 6, while the same rate would apply to such barley space as is being called for for the same destination from San Francisco, although in the latter part of May and early June barley space was commanding 35 -.

For wheat from the North Pacific to the United Kingdom, the British stmr. Benmacdhui has been fixed for June loading at 35/- with the option of Mediterranean at 37 6; Danish motorship Peru for June loading from British Columbia to United Kingdom at 31 3; British stmr. Bradford City, British Columbia to United Kingdom, 32 6, June.

The only fixture reported in grain for Japan is Danish motorship Indien, taken by Mitsui & Co., June loading, terms private.

For lumber for Australia the following fixtures have been made: American ship Phyllis to one port Australia by J. J. Moore & Co., terms private; Japanese stmr. Oregon Maru for June-July loading by J. J. Moore & Co. at $12.50 a thousand feet; Danish stmr. Parana by W. L. Comyn & Co., $13; British stmr. Madawaska by Pacific Export Lumber Co., July-August loading, terms private.

British stmr. Gambia River is fixed by J. J. Moore & Co., July loading, for full cargo of lumber from the North Pacific to Port Sudan at $15.50 and the same charterers have taken British stmr. North American for lumber to Japan at $8.50. W. L. Comyn & Co. have fixed Japanese stmr. Malta Maru for full cargo of lumber from the North Pacific to two ports West Coast of South America at $10.25 a thousand feet, and for South Africa, Dutch stmr. Driebergen has been fixed for lumber for two ports discharge by Heatley & Co. of London at a rate of $17.50 a thousand feet; American stmr. W. R. Chamberlin Jr. is chartered for lumber from the North Pacific to North of Hatteras at $15, June loading; same business American stmr. Juvigny for discharge at New York for June loading at a rate of $14.50.

The following fixtures in tankers are reported: British tanker Bright Light on time charter, 12 months trading, 8 - per deadweight ton per month; British tanker Olna, six months trading, 8 1/2, June; American tanker Hagan, San Pedro to Balboa, fuel oil, terms private; American tanker Baldhill, California ports to North of Hatteras, crude, at 80 cents per barrel, May, June; Alameda, same business, 82 cents, May, June; Atlantic Sun, California ports to Philadelphia, 82 cents, June.

American stmr. Point Judith has been taken on bare boat time charter by Swayne & Hoyt, delivery and redelivery this coast, two round voyages Gulf of Mexico, terms private; American stmr. Nushagak has been sold to the Remco Steamship Company; American bark Intrepid to the Intrepid Co. at $1500 and American schooner Lottie Bennett to Leo Zane, terms private.

Page Brothers, Brokers.

SMALL PORTABLE AIR COMPRESSOR

A SMALL portable air compressor plant of modern design and construction, has been developed and is now being offered by the Ingersoll-Rand Company, 11 Broadway, New York.

Designated as the 4 1/4-inch x 4-inch Type 20, this compressor has a piston displacement of 60 cubic feet per minute, and is built along the same lines as the larger Type 20 portables. All of the proved features of the larger units are retained: e. g., duplex, vertical compressor, direct-connected to a four-cylinder, four-cycle, tractor type gasoline engine; enclosed construction; circulating water cooling system for engine and compressor with sectionalized-radiator, fan, and pump; compressor regulator and engine control for reducing speed during unloaded periods; one-piece cast steel frame; sheet steel roof and removable side doors. The machine is compact and steady; each part is accessible; anyone can operate the compressor; it is easy to move.

The 4 1/4-inch x 4-inch Type 20 portable opens up a new field. Its moderate cost makes it possible and decidedly profitable to use labor-aiding compressed air equipment for work which was formerly considered too small to warrant purchase.

This compressor can be furnished with a variety of mountings, such as steel wheels and axles, wooden artillery wheels with solid rubber tires and steel axles, on a Ford truck, and on skids for mounting in a car or truck, with either gasoline engine or electric motor drive.

The 4 1/4-inch x 4-inch Type 20 gasoline engine driven portable compressor will operate, in general service, the following Ingersoll-Rand air tools: one BAR-33 Jackhamer rock drill; one CC-25 paving breaker; one 56-H clay or trench digger; two 22-SR backfill tampers; two 2-S calking or chipping hammers; one No. 90 riveting hammer.

PAINT AT SEA

(Continued from Page 372)

tions of decks, these are still being painted to a large extent with red lead. For this purpose, red lead is quite suitable, but a high-class oxide of iron paint is less expensive and would give fully equal results. Moreover, red lead, as well as white lead, is poisonous, and although those employed in their application may not show acute symptoms of lead poisoning, the amount of lead absorbed into their systems by those handling these materials will, in a measure, undermine their health. In France and Germany, before the war, the use of lead paints was made by law so difficult that they had to be abandoned, and oxide of iron paints have since been used almost exclusively. Zinc paints are also non-poisonous, and lastly, another material called Titanium Oxide has been introduced in paint with great success. This is generally mixed in paint together with zinc oxide or zinc white, and it retains its color much better than zinc and lead preparations. It is surprising that the labor organizations in this country have not moved to make the almost indiscriminate use of lead paints illegal, and particularly that the experts of the Bureau of Standards, who are responsible for the specifications of many paints containing large percentages of white lead, are still satisfied to be under that responsibility.

Care of Paint Stores

In regard to the use of paint at sea, ships' officers should bear in mind the following facts: Paint is generally stored in the forepeak or in some small confined storeroom. Many explosions have taken place from paint which was left open and which contained low-flash volatile spirits. The drums in which such paint is contained are generally marked with a red caution label. Such paint is really not fit to be stored in a ship's storeroom, as it may lead to explosions and endanger the lives of people on board, and even the ship herself. Containers with a red caution label should, therefore, be rejected as ship's stores. Paints made with petroleum spirits do not give off an explosive vapor except at temperatures of 100 degrees or over, but in any case it is desirable to always firmly close the containers from which any paint has been taken, not only on account of a possible danger from explosion at high temperatures, but also because the volatile matter would otherwise escape and a skin form on the surface of the paint which, if subsequently mixed with the paint, would spoil its surface and appearance.

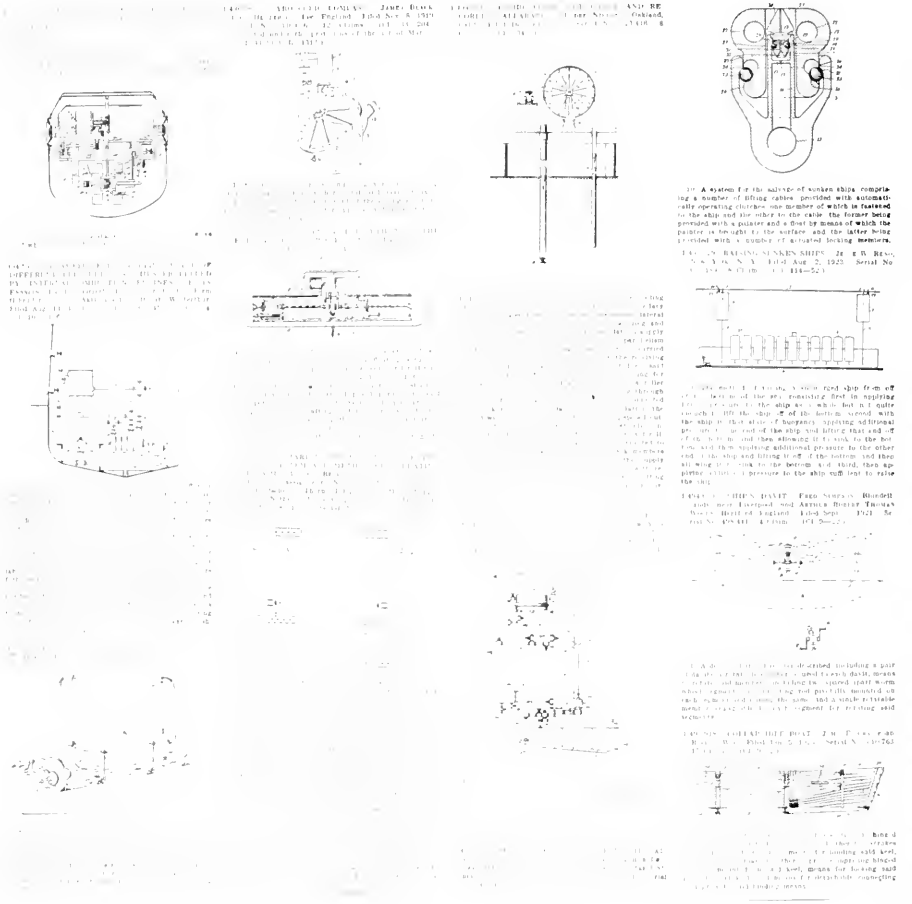
Using Paint on Shipboard

In the past, a great deal of paint in paste form has been ordered and has been mixed on board with linseed oil, turpentine and dryers to the required consistency. This is the old-fashioned method, which is rapidly being superseded by ships purchasing ready-mixed paint. The microscope has shown that hand-mixed paints are vastly inferior to machine-mixed paints, which latter are gradually but surely replacing paste or dry paints on the order sheets of ships. These need only to be stirred up thoroughly before being applied.

As a first coat, it is customary to apply a priming paint. As a last coat, an enamel paint, like Lagoline, should be applied both to deck houses, in cabins, staterooms, etc., because this is washable and will retain its appearance much longer than ordinary paint. Paints containing white lead change color and darken when exposed to any sulphur fumes and various other influences. They are also poisonous. In all cases, it is

(Continued on Page 11, Advertising Section)

MARINE PATENTS OF THE MONTH



TODD BURNERS EFFECT ECONOMIES

FIGURES and other information recently available regarding the performance of vessels equipped with Todd oil burners indicate that substantial economies have been effected and that the efficiency of the vessels has been materially increased.

The Homeric reached New York on May 8 on her first voyage after conversion from coal to oil burning. The White Star Line, owners of the Homeric, stated that the vessel's speed had been increased by augmented by the adoption and that her

highly satisfactory, being less than half the fuel consumption of the Majestic and the Leviathan.

In addition, the change over to oil effected a reduction in the fire room force from 171 men to 39 men, reduced the fuelling time at New York from three days to fifteen hours with the labor of eight men to tend pumps, a cut of more than 200 from the crew required to shovel and trim coal.

The Homeric has a capacity of 5050 tons of fuel oil in her tanks, which have been built into her hull for the full length of her four boiler rooms, 242 feet. No oil is carried in the double bottom, which is reserved for salt water ballast and for fresh water supply. Her capacity has been increased 500 tons by these changes.

Another noteworthy performance of a vessel burning oil with Todd burners is that of the President Pierce of the Pacific Mail Steamship Company. This vessel formerly consumed 1000 barrels of oil for a day's run at an average speed of 15 knots. In a report received a few days ago the engineer stated that the fuel consumption with Todd burners had averaged 629 barrels per day at an average speed of 15.1 knots as compared with 700 barrels a day.

AMERICAN FOREIGN TRADE POLICY

(Continued from Page 352)

the promotion of American foreign trade. This is the second of the two great services to which reference has been made. One effect of the flotation of foreign loans in this country seems to be fairly well understood. Except on the very rare occasions when gold is shipped as a result of such a loan, their proceeds bo abroad sooner or later in the form of exports of American products. The outstanding example of this was the war loans made by the United States to our belligerent associates against Germany. The actual shipments consisted of different kinds of war materials, the cash remaining in this country. We exported merchandise and imported securities in return. That is the most immediately apparent usual result when a foreign loan is floated here. In other words, it is really a transaction in foreign trade. Of course, if the loan were made for refunding purposes there would be no corresponding export of American products. That is merely an extension of time on a trade transaction already effected.

Foreign Loans

Occasionally, however, it becomes possible to obtain indirect results of no small advantage to our foreign trade from the flotation here of foreign loans. These results, although not so obvious as those first referred to, may be of decidedly more importance to American industry. They may have a long continuing beneficial effect. Such loans may mean, for instance, the building of railways in other countries, equipped with American material, or the installation of American machinery, or the establishment of some form of enterprise that will call repeatedly for American merchandise. They may mean the employment of American citizens abroad in construction of managerial work, with consequent certain and continued increase in the demand for all kinds of articles from home.

European exporting countries have built up their foreign trade substantially by this means. A long list of conspicuous illustrations, such as the British financed railways of Argentina, might easily be given. In this way the foreign trade of the lending country is permanently expanded.

The opportunity of American finance to extend our foreign trade in this manner is obvious, but it seems not to have engaged the attention and effort of our financiers to the fullest extent possible. Frequently bankers in other countries who are engaged in negotiating the terms for foreign loans manage to arrive at an agreement with the borrowers for the expenditue of all or part of the loan proceeds within the lending country. Recently even governments have followed this procedure. The British government is authorized by Act of Parliament to guarantee, up to a total of fifty million pounds sterling, or more than $225,000,000 at present rates of exchange, loans made by "any government, any public authority, or any corporation or other body of persons" when satisfied that the proceeds of such loans "are to be applied toward, or in connection with, the carrying out of any capital undertaking, or in connection with, the purchase of articles other than munitions of war, manufactured or produced in the United Kingdom required for the purpose of any such undertaking, and that the application of the loan in the manner proposed is calculated to promote employment in the United Kingdom."

The importation of sound securities serves either to fund or refund existing foreign obligations, or to furnish new occupation for American industry. In periods of domestic unemployment, when it is the American habit to devote especial attention to our foreign trade, sound American foreign trade policy clearly calls for every effort on the part of American finance to promote prompt occupation for our people. It is of the utmost importance that our investment bankers, when negotiating foreign loans, should always have it in mind so to handle them as to further American trade, and they should, as far as practicable, provide for the expenditure of some portion of the proceeds in this country for prompt, rather than ultimate, exports.

American Representation

It is only natural that American traders abroad should encounter a little more sympathetic service at the hands of the branches or agencies of American financial institutions than they would from those of foreign concerns. It is only natural that there should be, on the part of such branches or agencies, a little better understanding of the conditions and requirements of American trade than would be found in foreign institutions. It is only natural also that there should be on the part of such American financial institutions abroad a greater and more whole-hearted desire to assist in upbuilding of American commerce than there is on the part of foreign concerns. In all these ways American finance may be helpful to the development of our foreign trade. Of course, profit is necessary if such branches and agencies are to be maintained permanently abroad. Pioneering in such work is likely to be discouraging. But it is to be borne in mind that finance is one of the four great and essential parts of thorough foreign trade equipment, and it will not be until our own systems of communication, transportation and finance are built up abroad to a point comparable with those of some of our foreign competitors that we shall have a really adequate foreign trade machinery. We do not suggest that American banks should go abroad or stay abroad on a permanently losing basis. But we do suggest the importance of taking advantage of every opportunity to extend their service to the benefit of our trade.

Tax Reforms

There are things to be done at home in the upbuilding of our equipment as well as abroad. We have a system of taxation that might have been designed to defeat, instead of to encourage, our foreign trade. This market, which ought to be one of those most favored by foreign enterprise seeking financing arrangement, is seriously crippled by the system of high income surtaxes that compel the demanding of terms by our investment bankers often materially higher than those offered by foreign countries. These high surtaxes not only thus restrict the flotation here of foreign loans that might be helpful to our foreign trade, they cut down to a minimum the free capital which otherwise would seek industrial investment and force it into securities that are exempt from income tax. They defeat the very purpose for which they are advocated by those who support them.

The United States is also the only trading nation in the world that maintains the indefensible policy of taxing its nationals resident abroad upon income earned in the country of residence. In return for the ridiculous aggregate of income thus obtained by our government, we lay an unjustifiable and foolish handicap upon our foreign trade by gratuitously and un-

necessarily increasing the difficulty of inducing competent Americans to take up residence abroad in representation of American international commerce.

Bargaining Tariff

Our foreign trade should have several additional facilities which are not furnished to it simply because Congress is willfully or stupidly blind to some of the most obvious facts of our modern development. We have the greatest market in the world to which we freely admit all comers on terms of absolute equality. They, in turn, discriminate against and hamper our trade in numerous and devious ways. Whatever the underlying principle of our tariff, the government should be equipped with authority that would enable it to deal effectively with such cases. We should have a real bargaining tariff.

We have a system of bonded warehouses which now provides, although with difficulty, delay and expense, practically all the facilities that would be afforded by a system of foreign trade zones. But in the foreign zone the handling, cleaning, grading and mixing foreign merchandise for re-export could be carried on promptly, cheaply and much more satisfactorily than at present. Also such zones would be considerably more cheaply and easily guarded for customs purposes than are the numerous and scattered bonded warehouses. We need and should have a foreign trade zone system.

Consular Service

We need and should have a thorough-going reorganization of the foreign service of the government. It should be established on the basis of a permanent career, so that it would attract competent young men from all parts of the nation. It should be adequately compensate, so that it would cease, especially on the subordinate diplomatic side, to be chiefly a haven for rich young men ambitious for social distinction. It should be a foreign service for the United States, and not for the different departments of the government.

These things, and more, are all possible. They are all mere details of an American foreign trade policy. They depend, for their establishment, on the will of the American people. Once the real favoring spirit manifests itself among the substantial majority of our citizens, there will unquestionably follow a different attitude in Congress toward helpful foreign trade legislation.

Foreign trade, in increasing measure, is an absolute economic necessity for the United States. The chief essential in getting it is the development of the will to have it among the American people. That is sound foreign trade policy.

PAINT AT SEA

(Continued from Page 41)

preferable to use paints made up of zinc oxide and titanium oxide, which retain their color longest and are also the best preservatives; and both are entirely non-poisonous.

Before any paint is applied, all loose paint and scale should be removed, the former by scraping, the latter by hammering or scaling. A first coat of zinc paint is preferable to a first coat of lead paint; in fact, at sea zinc paint is preferable to lead paint.

On all hatches, hatch-coamings and in holds, Danboline paint should be applied; on winches, a good machinery enamel is to be recommended; on steam pipes, a heat-resisting asphaltum paint will give good results, while oil paint will rapidly go to pieces.

In reference to quantities needed for voyage as stores, it should be borne in mind that a gallon of the usual mixed paints will in actual practice cover about 300 square feet with one coat.

ANTI-FOULING PAINT

Editor, Pacific Marine Review,
San Francisco, Cal.
Dear Sir:

I have noticed the communication from the Shipping Board in your May issue in which the following statement is made:

> "Furthermore the bottom paint which we are now using is satisfactory for ships operating on all routes, and as a matter of fact is of higher standard than is generally required for the Northern routes."

The other day I accidentally came across a document issued by the Emergency Fleet Corporation calling for estimates for compositions to be supplied in the port of New York, and it was pointed out to me that material changes had been made in the character of the composition called for compared to what has hitherto been used and what was also on the Hog Island, for the new specification states that in the first place the varnish or vehicle is altered by the partial substitution of Yacca Gum for Shellac. In the second place, copper oxide is for the first time introduced in this new paint in partial substitution for mercury oxide.

There are also various minor changes, but the two changes named are sufficient to show that the original specifications were not considered entirely satisfactory.

A well-known authority on anti-fouling paints, whom I consulted in regard to this specification, informed me that the new specification was at least as amateurish as the one now abandoned and which proved so entirely satisfactory according to the statement you published.

I remain,

Yours truly,
CONSTANT READER.

PAINTING LAID-UP FLEET

IT is reported that the Shipping Board is arranging to scale the whole of the steel surfaces of its 900 laid-up vessels, and to paint these surfaces. Some work of this sort is decidedly necessary in order to prevent further damage by corrosion. It is estimated that the cost of scaling and painting, apart from the purchase of the necessary plant, such as barges, air compressors, scaling tools, etc., will be around $20,000,000, if it be done within twelve months. Whether Congress has voted this sum we do not know.

It might be suggested that, as a good deal of this work may have to be done over again after it has been decided to refit the vessels with oil engines, a more economical method would be to simply wire-brush the vessles and to spray the surfaces with raw linseed oil. This would have the tendency to penetrate through and behind the rust and scale and would best preserve the plates till the time when they are finally refitted for going to sea.

MOTOR ROOM EQUIPMENT

(Continued from Page 365)

easily capable of handling the load of maneuvering compressor, windlass, warping winches, lighting, steering gear, and engine room pumps when docking ship.

The generators should be kept well above the tank top, and the cables should be overhead if possible instead of under the plates.

Pumps

Cooling water pumps should be at least three in number, all identical and of the vertical spindle centrifugal type motor driven. Each pump should be able to draw from the sea or from the cooling water return from the engines and to discharge to either the salt or the fresh side of the cooler. The pumps should have ample capacity, especially as regards the power of the motor, and should be designed for a sea temperature of at least 90 degrees. The water ends of the pumps should be placed as low as possible and as near the center line of the ship as practicable, if this can be arranged, on account of rolling. The motor end of the pump can be placed well up, in order to be more easily protected from dirt and damp, but the water end requires to be low so that the return water can flow to it by gravity.

Low pressure piston cooling should be used, if possible, so that one pressure of water does for all purposes; but if pressure jets must be used, a small second stage could easily be added to the jacket pump, so that a small amount of the water could be boosted up to a higher pressure.

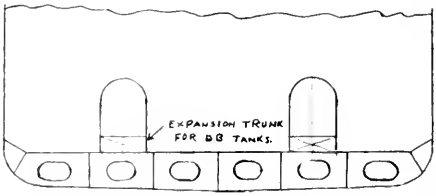
At sea, with this arrangement, one pump would be used to circulate the salt side of cooler, while another one would deal with the fresh water circulation, leaving the third one as a standby. A separate inlet valve to each cylinder from the cooling water manifold pipe would be an advantage and would save loss of water when overhauling; also, it would permit of the other cylinders being kept hot while overhauling might be in progress on one of the number. An air escape valve should be fitted to the highest point of each cylinder head water jacket, with a permanent pipe leading down to the piston cooling funnel. This valve should be kept open continuously at sea. The ballast and sanitary pumps should be capable of discharging to the salt side of cooler.

The maneuvering compressor is usually motor driven and arranged to pump up blast bottles or to deliver direct to the starting tanks. Pressure gauges should be fitted handy to the compressor to show the pressure in the starting tanks and also in the blast bottles in use, when maneuvering.

The emergency compressor should be coupled to both a steam engine and an electric motor, so that it can be used in port to charge the starting air bottles for the auxiliary generators and thus kept in good working order without having to get steam in the donkey boiler.

Lubricating oil pumps should be of the rotary plunger type and direct motor driven, if suitable speeds can be arranged. Daily service pump should be of the rotary plunger type, motor driven. Sanitary pump should be of the vertical spindle centrifugal type. Fresh water pump should be centrifugal if below the fresh water [illegible] tanks, otherwise a plunger pump unless a ce[illegible] exhausting pump is fitted.

It will be [illegible] centrifugal pumps have been recommended [illegible] majority of cases, for the following reasons: [illegible] cost, lower maintenance cost, and, in fact, ve[illegible] to go wrong with them; no harm can be done [illegible] pump is started with the discharge valve shut and consequently no escape valves need be provided. If an efficient separately driven central air exhausting pump be fitted and connected up under the non-return discharge valve of each pump, no trouble whatever should be experienced. On no account must the air exhauster be driven off the centrifugal pump spindle, unless at a very moderate speed and so connected that it can be started and stopped without stopping the centrifugal pump from which it is driven. Crankpin bolts become rapidly fatigued in a connecting rod connected up to a rapidly reciprocating and heavy piston which has to be run continuously.



The motor starters for all pumps should be of the simplest possible design and no speed regulating devices need be provided.

Electric motors should be all of the same make where possible, and as many as possible of the same size, even if some of the motors have thus to be slightly on the large side, as this will be amply compensated for an account of the smaller number of spare armatures and other parts needed. Fuel settling tanks should each be of a full twelve-hours' capacity and on similar lines to the lubricating oil tanks. Internal pipes should not be fitted for draining off water as these are liable to give a false reading in the hands of an inexperienced man, and a considerable quantity of oil has to be drained off before the true contents of the tank can be ascertained. The water drain pipe should have a straight lead down to the bottom platform from the bottom of the cone on the tank. With this arrangement the tank can be kept clear of sediment, and any water in the tank will show instantly on opening the drain cock.

A primary settling tank should be provided. When bunkering this would act as a gravity tank by running the oil from the barge direst into it and distributing from it by gravity to the various double bottom tanks. It will thus be very easy to watch the ullages and the tanks can be filled quite full and a few strokes of the pump taken from each later, if there is likely to be expansion. When pumping out bilges or double bottoms in port which are used alternately for fuel and ballast, a large amount of oil could be saved by this fitting, as when oily water is being dealt with it could be passed through this tank and the water drained from the bottom and pumped overboard without fear of polluting the harbor, and the good oil saved and used as fuel.

Sounding pipes should be fitted to both forward and after ends of all double bottom tanks. These sounding pipes should have the part inside the tank split vertically so that when testing for water with water finder papers the true contents of tank will be shown.

The space between the tank top and the floor of the tunnels should be made oil tight, and should serve as an expansion trunk for the double bottom tanks.

Pacific Marine Review

The National Magazine of Shipping

AUGUST, 1924

Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION
OF THE PACIFIC COAST

AUGUST, 1924

Vol. XXI. No 8

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

339 AT 30 CHURCH STREET, NEW YORK

James S. Hines, President and Publisher.

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Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1924, by J. S. Hines.
Published on the 25th of each month preceding the publication date.
Advertising and editorial forms close on the 20th.
Subscription price, a year: domestic, $2; foreign, $3; single copies, 25c.

Alexander J. Dickie, Editor.

Paul Faulkner, Advertising Manager.

THE MERCHANT MARINE IN WORLD TRADE

By LEIGH C. PALMER

President, United States Emergency Fleet Corporation

THERE has been much discussion as to the needs of the American merchant marine, and it is now apparent that the people of the country demand it to bring us closer in touch with the world markets for our surplus produce and manufactures, to protect our shippers and importers from exorbitant freight rates, and to become a powerful arm of our national defense. There seems to be, however, a general consensus of opinion that under our present laws and standards of living some aid will be necessary in order to enable us to compete on a favorable basis with foreign shipping lines.

The government can aid the merchant marine, either directly or indirectly, in many ways, but we should not rely unduly upon it. While government aid is to be encouraged and welcomed, it is more important for the lasting good of the merchant marine that private enterprise be directed to the solution of our shipping problems with a view to diminishing, and eventually removing, the differential that exists between American and foreign operating costs.

For three-quarters of a century our people, bent on the exploitation of our vast internal resources, turned their backs to the sea and left the comparatively unremunerative business of shipping to other peoples less favorably circumstanced. This has given rise to the belief in some quarters that ours is not a maritime people; that by nature we are inept on the sea. Such a belief is not founded in fact. Our nation in large part has been built of the seafaring peoples. Our maritime achievements in the early half of the last century, as well as our naval accomplishments throughout our history, have demonstrated our fitness

Address before the National Foreign Trade Convention at Boston, Massachusetts, June 6, 1924.

THE NEW IMMIGRATION LAW

THE new Immigration Law effective July 1 contains some features very detrimental to the interests of shipowners of the American merchant marine and particularly those operating vessels engaged in world trade. During the debate on the bill these features were obscured behind the smoke screen raised by the Japanese question. The action of the Los Angeles Immigration Commission in seizing for deportation forty-three members of crews of American tankers has drawn attention to the serious shortcomings of this law and has raised a storm of protest from shipowners and allied industries.

Section 19 of the Act reads:

"No alien seaman excluded from admission into the United States under the immigration laws and employed on board any vessel arriving in the United States from any place outside thereof shall be permitted to land in the United States, except temporarily for medical treatment, or pursuant to such regulations as the Secretary of Labor may prescribe for the ultimate departure, removal, or deportation of such alien from the United States."

Regulations by the Department of Labor and other governmental departments have been in force for generations covering the case of alien seamen ashore in our ports. No new regulations, however, have been issued since the effective date of this section. Strictly interpreted the section stands as worded and any alien seamen, though he may have served in the American merchant marine faithfully for years, if he goes on a voyage foreign is subject to seizure and deportation on his return to an American port.

Since over 50 per cent of the seamen now on American vessels belong to this class and since the majority of these men will have to be deported to their places of birth unless the Secretary of Labor makes prompt remedy for this situation, our merchant marine will be in a very crippled condition.

The shipowner is certainly in a bad way between the Department of Labor and the American Congress.

It is high time that the Federal government, biggest shipowner in the world, learned that in framing navigation laws and in enforcing all regulations affecting ships the main purpose should be to keep the ships moving regularly on their useful work and not to keep them uselessly tied up at a dock.

on the sea. The call of the sea will find a ready response when economic conditions become favorable to American enterprise thereon. That time is slowly but surely approaching. The marketing abroad of the surplus created by our supremely efficient labor is becoming more and more a vital necessity; our raw material requirements are growing; and the transportation that will insure the free and unrestricted movement of our ocean commerce must of necessity be largely in our own hands.

Emergency Effort

We have been passing through an extraordinary and costly experience in shipping. Suddenly and without adequate preparation our government has had to face the task of liquidating a huge war-created fleet and the problem has been complicated by unprecedented economic conditions due to post-war inflation and the subsequent depression in world shipping. When one considers our pre-war inexperience—that is to say, that comparatively few of our people had an intimate working knowledge of ocean shipping—it is not surprising that mistakes were made, and that there have been apparently unnecessary extravagance and loss in both private and government controlled shipping enterprises. Any business launched on a tidal wave of prosperity is likely to find itself in difficulties later on. But much real constructive progress has been made in the last two or three years, and we are hoping that the plans now prepared will do much towards putting the merchant marine on a sound business basis.

When you consider the unfavorable economic conditions generally, and more particularly the conditions obtaining in international shipping, it is gratifying to note that several private American corporations are successfully operating tonnage under the American flag in foreign trade. To a considerable extent, these corporations are what are known as "industrial carriers"—that is, their prime purpose is to carry the products of parent corporations—but most of them are common carriers as well. My observation of these services leads me to believe that they are very efficiently maintained and are well serving the national trade interests. They have some advantage over independent American operators in that they are assured of basic cargoes for their vessels, where as the latter must compete for every ton of cargo they get. For the same reason the industrial carrier has an advantage in his competition with foreign services and this offsets in a large measure the differential in operating costs between the American and foreign-flag vessels. I believe that the industrial carrier as well as the independent carrier should be encouraged in every proper way by our government, certainly as long as the differential exists, for it appears to me that in the development of specialized services lies our best hope for a privately-owned American merchant marine in the overseas trade.

Private Operation

While the government-owned services necessarily must be maintained until they can be disposed of to private citizens in accordance with the Merchant Marine Act, it is most desirable that their operations should not encroach upon, or compete with, those of privately-owned lines, and we will endeavor to avoid such competition.

The large number of operators of Shipping Board services who came into being during the post-war period of inflation has been reduced gradually to a comparatively few and the process of elimination is still going on. Naturally, the most inexperienced and the weakest of the operators disappeared first. Most of the survivors, some of them with previous experience and proved ability, are believed to be in the business to stay, and it is the desire of the Emergency Fleet Corporation to encourage and strengthen them in every proper manner. They are trustworthy and should be trusted more and more as their experience and efficiency develop. It is our purpose to give them greater responsibility, allow them greater latitude for the exercise of initiative, and reduce as far as the protection of the government's interests will permit the supervision that must be exercised over them by the Emergency Fleet Corporation.

Consolidation

As is well known, we are consolidating the services on the several regional trade routes with a view to building up business-like lines with all the attributes of permanency. We are endeavoring to improve along all lines that will mean increased efficiency, such as shortening the turn-around, going after the freight, helping to stabilize rates, and living within the means allotted to us. Expenditures for fuel, stores, and supplies are being reduced and a definite accounting is required to reduce the number of groundings, collisions, fires, pilfering, and loss of cargo. We are doing this not only to put the lines in the best possible condition for present operation at the expense of the government, but also—and equally important—for the purpurpose of putting them in the best condition for eventual disposal to private citizens. It is only by such means, we believe, that they can be made self-maintaining and therefore saleable. Several of the services are approaching this satisfactory condition. Others, which do not show so satisfactory a balance sheet, must be carried at government expense as long as there is a prospect that within a reasonable time they will become self-sustaining, but it must be borne in mind some are performing a distinct service not to be dispensed with abruptly without creating considerable confusion in the business world. Manufacturers and shippers have grown to depend upon them. They have had probably a decisive influence in maintaining ocean freight rates at a low level, though in this connection it is to be pointed out that abnormally low rates are prejudicial to the proper development of transportation and that we must have a living freight rate if we are to attain our objective, which is to make our services self-maintaining. To constantly carry our commerce at less than cost is to subsidize the shipper at the expense of the taxpayer. Some interests may profit temporarily from such continued action, but the merchant marine would suffer.

But to return to the matter of reorganization, or consolidation, of services, if the ships on a line are losing, say, $25,000 a voyage, that line is not saleable; but if by better organization and management we can reduce losses next year to, say, $15,000 per voyage, and the following year to a still lower figure, that line will become saleable and doubtless will pass into private hands as contemplated by the Merchant Marine Act. Furthermore, as we succeed in placing these lines on a sound business footing we shall no doubt gain, in increased measure, the confidence and patronage of the shippers.

We do not yet know the differential between operating costs of a government-owned line and the same or similar line under private ownership; because our government-owned services have not heretofore been organized and operated under conditions directly comparable with those of a private line. It is our purpose

to mold our lines into entities similar in all respects to private lines except for the unavoidable feature of Emergency Fleet Corporation supervision. When we shall have done this, the differential in operating cost can be said to be the cost of such supervision, and we shall be able for the first time to appraise the real value and prospects of the lines.

The Merchant Marine Act directs that the vessels and services should be turned over to private owners whenever this can be accomplished satisfactorily. If the Emergency Fleet Corporation can economically and efficiently control the operation of the lines and develop them to a point where they will appeal to operators as a good business investment, the Corporation will have accomplished what was evidently the desire of Congress. It follows that the mission of the Corporation is not to perpetuate itself, but to work itself out of existence at the earliest practicable date.

Naval Auxiliary

The merchant marine should not be regarded from an exclusively commercial viewpoint. While its prime purpose is to serve the nation's commerce during times of peace, its great value as an element of national defense should be kept in mind. Modern warfare is waged with practically all national resources and the commercial fleet is hardly second in importance for purposes of national defense to that of the regular naval establishment. In proportion as the principal of naval disarmament is adopted and the regular naval fleets curtailed, the commercial fleet becomes of increasing importance for both offense and defence. It has long been an established policy of certain foreign governments to develop special types of commercial vessels for possible use as naval or military auxiliaries. Probably, in view of the tendency toward disarmament, such a policy will be more fully developed and doubtless our government will take cognizance of this in its encouragement and development of our merchant marine, more especially in the creation of the high-class passenger and combination passenger and cargo types of vessel, in which our commercial fleet is notably deficient. However, such additions can be justified economically only on commercial considerations. They must almost, if not quite, pay their way, the government assisting them to such an extent as may be consistent with the public interests.

Coordination with Railroads

Probably the most effective aid that could be rendered to our merchant marine would be the coordination of rail and ocean transportation in such a manner as to make the ship lines in effect extensions of the rail system. This would almost automatically route exports by American ships. Every railroad freight agent would be practically an agent for American ships. We have had practical illustrations of the working of such arrangements in agreements between certain American railroads and foreign steamship lines, though these probably originated in a normal commercial way with the investment of foreign capital in this country while our nationals were not awake to an appreciation of the situation.

The Favoring Spirit

A second aid to American ships would be the fostering among exporters and importers of the "favoring spirit" toward American shipping which Mr. Farrell has so often urged. By this is meant that shippers may properly be asked to route their goods by American ships when such ships are in position to give as good service as their foreign competitors. Commerce in general will follow the line of least resistance, and it is not to be expected that our shippers will favor our own ships when it is contrary to their business interests to do so, but if we provide adequate, reliable, and efficient service fully equal to that of competing lines, we can properly appeal to the patriotic sentiment of our shippers to exercise a favoring spirit toward our ships, since to do so would be in their own interest as well as that of the national foreign trade.

I would not go so far as to say that American citizens should in every case feel duty bound to travel by American vessels, but it is to be hoped that the "favoring spirit" may be developed in our travelers as well as in our shippers, for certainly our merchant fleet cannot attain its proper proportions unless and until our citizens give our passenger services their personal patronage and support in the same measure that foreign lines are patronized by their nationals.

It is natural in the present circumstances to dwell upon the possibilities of competition and of taking business from the foreign carrier, but unrestricted competition in the long run would be ruinous to all concerned. I hope to see in the future less competition and more cooperation between rival commercial interests. Ships must have cargoes both outward and inward and a living freight rate if they are to operate on a sound business basis. As I see it, the only way that this condition can be brought about is through mutual tolerance and concession by rival interests—that is to say, through cooperation.

Permanency

Our government and our people are showing their determination to keep our flag on the seas. We have gained and are holding a fairly satisfactory share of the carriage of our ocean commerce. We shall do better as we gain experience and become more skillful in matching our wits against those of our competitors. So the time must come when conflicting interests will have to be reconciled—when competitors will realize that, in order that each may prosper, they must work in harmonious agreement.

We of the Emergency Fleet Corporation have a definite mission defined by law, which is to maintain services on the essential trade routes not served by private American lines until such services and vessels can be satisfactorily disposed of to private American citizens. But while the Emergency Fleet Corporation is of a temporary character, its services are being built up to endure, temporarily under the Corporation and permanently under future private ownership. This fact cannot be too strongly emphasized, for our shipping public must be brought to realize the permanency, adequacy and reliability of our services, else it will not accord them a due measure of support and patronage.

Confidence

Confidence is most essential to this most delicately balanced shipping industry. There is much uncertainty in some quarters as to the future maritime policy of the United States, notwithstanding the declarations of the Merchant Marine Act, because world shipping conditions have undergone great changes since that act was framed. At that time shipping was enjoying the greatest boom in its history, but shortly thereafter began the present unparalleled depression. It is not surprising, therefore, that there should have been some question as to whether the policy of our government formed during a period of prosperity might be expected to continue unchanged.

(Continued on Page 106)

The steamer Sierra of the Oceanic Steamship Company's Australian service.

RENEWED OCEANIC LINER SIERRA

The Potrero Works of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., Completely Modernize Favorite Australian Line Steamer

WORKING to plans and specifications prepared and executed under the personal supervision of F. S. Samuels, assistant to the president of the Oceanic Steamship Company, a complete transformation has been wrought by the Potrero Works of the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., on that good old favorite of South Seas travelers, the steamer Sierra.

In 1917 the Sierra was turned over to the United States government by the Oceanic Steamship Company. After war service as a transport she was returned to her original owners, who sold her to the Green Star Line. After overhauling, she was sold to the Polish Navigation Company and converted into a steerage passenger carrier on the North Atlantic run, operating under the name of Gdansk. The Polish owners having failed, the Gdansk was put up for sale by the creditors.

Grand Stairway on the steamer Sierra.

Rebought by her former operators, the Oceanic Steamship Company, the Sierra was then brought back to her home port of San Francisco for overhaul, renewal and repairs, the intent of which—to quote the specifications—was "to place the structure and equipment of this ship in first class condition throughout."

Corner of the first cabin dining saloon.

Not only has this been accomplished, but several new and valuable features have been added. The accommodations for first class cabin passengers have been increased and the ventilation of both first and second cabin space greatly improved.

Both the appearance and the capacity of the vessel have been greatly improved by the erection of a wooden house on the boat deck, making accommodation space for officers. With all interiors finished in pine or cedar with oak trimmings, and with all outside doors in teak, this house, with a sun deck above, provides very comfortable living quarters for all deck officers. The arrangement of lockers, drawers, and desks is very convenient and complete and ample provision is made in both rooms and lavatories.

In the spaces devoted to first and second cabin passengers and in the de luxe staterooms practically all finish and interior trim had to be renewed or refinished, and the Oceanic Steamship Company has taken advantage of that fact to rearrange some of the staterooms and to remodel and greatly improve the entrance hall and the access to the social hall.

In the after house on the spar deck, a second cabin smoking room and companion way have been fitted, and the deck house amidships on this deck has been extended aft to form a second cabin social hall, fitted with card tables, desks, settees, and comfortable fur-

Interior view showing various classes of stateroom accommodations on the Oceanic liner Sierra. The metal beds are furnished by the Simmons Company.

niture. The illustrations herewith will give a good idea of the simple elegance and comfortable homey atmosphere produced by the new furnishings.

For heating public rooms and staterooms and to provide power for enlarged fan capacity in the ventilating system, additional electric energy is provided by the installation of a 50 kilowatt Westinghouse turbo-generating set. All public rooms are fitted with stationary electric heaters, and each stateroom is provided with suitable outlets for attachment plugs for portable electric heaters.

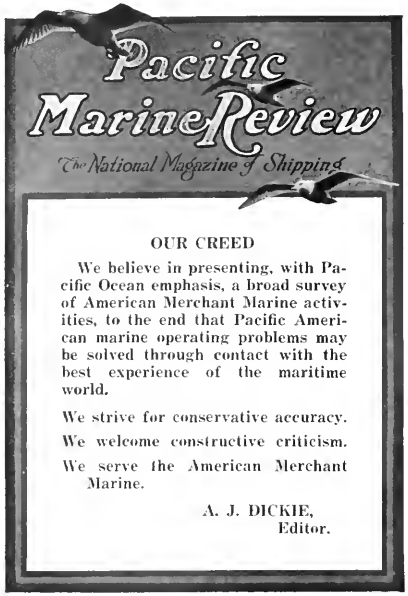
Completely overhauled and fitted with oil burning system, the galley range is now equal to all demands made upon it. The old bake ovens have been removed and in their place a three-section Westinghouse automatic sectional type electric bake oven has been installed, as well as an Edison hotel service electric broiler. A dumb waiter operated by hydraulic ram serves the first cabin pantry from the galley. Both the first and the second cabin pantries are equipped with electric griddles, toasters, and egg boilers, electric dish washing machines, steam tables, and steam coffee urns.

These additions and alterations with many others, which space limitations will not permit us to mention, involved an immense amount of detail work. The item of doors will illustrate. Every exterior stateroom or public room door had to be renewed. The new doors were all of flush panel type in teak fitted with heavy brass mortise locks.

Beaver tile has been extensively used in floor coverings for public rooms and for de luxe cabins. This material permits a pleasing variety in pattern and color effects to blend with wall panels and furnishings. J. M. McMahon, San Francisco representative of the Beaver Cork Tile Company, has taken an especial interest in this job, personally supervising the laying of the material on the ship. In the bath rooms and lavatories ceramic tiles or granitile are used for floors.

Vehisote framed in cedar makes a very attractive

(Continued on Page 106)



More of Section 28

IN a July editorial we warned shipowners that Section 28 was only "temporarily moribund." Now comes no less an authority than the National Merchant Marine Association demanding that the Shipping Board " . . . certify to the Interstate Commerce Commission that on a named date Section 28, providing for preferential rail rates on goods carried on American vessels, shall be applied so far as all imports are concerned, and so far as both imports and exports in the trade with South America are concerned."

This demand is made for the reason that the association thinks the enforcement of Section 28 on imports will bring return cargoes to American bottoms. As Shipping Board vessels, on the authority of their own statistics, are going out 90 per cent full and coming back 90 per cent empty, this argument should have some weight with the Board.

On another page of this issue of Pacific Marine Review is printed an article analyzing the probable effects of the enforcement of Section 28 on Pacific Ocean rates.

Return Cargoes

IN the obtaining of return cargoes for the merchant ships of any nation there is more to be considered than rates. In some form or other return cargoes have to be bought by the shipowner or the shipowner's nationals. Foreign trade is not American or British or Swedish or Dutch—it is international.

This international trade in its flow in and out of American ports shows a larger bulk in the outgoing than in the incoming flow, and consequently our ships suffer disproportionately on the return voyages. We already have a strong tariff wall erected against many classes of imports, and it would seem that what amounts to an added charge on the producer of those imports would hardly increase their volume. The application of Section 28 of the Merchant Marine Act of 1920 to imports undoubtedly would divert a greater proportion of those imports to American bottoms temporarily, but would it not in the long run divert a large portion of both export and import trade into other routes?

We must not forget that our merchant ships are only our sea delivery wagons, and we have no monopoly on the goods we are selling.

Diesel Conversion Program

THE Shipping Board has selected twelve steamers for conversion to diesel engine power and is now at work with an advisory committee selecting the type of equipment to be used. The vessels selected are of two types, six of standard 8800 ton deadweight capacity type and six of the Moore 9400 ton deadweight capacity type.

The Board desires a sustained sea speed of 11 knots at 90 revolutions with direct connected engines. This means about 2600 shaft horsepower in one engine. "Only engines of proved reliability will be used and the builders must unequivocally assure full responsibility for their satisfactory performance. Electrically driven engine and deck auxiliaries will be used throughout.

The advisory committee is composed as follows: Chairman, Rear Admiral H. I. Cone, assistant to the President of the Emergency Fleet Corporation; secretary, Angelo Conti, consulting engineer of the Ship-

"ARRIVED—ALL'S WELL"

JEREMIAH (JERRY) DAILY closed his log the other day—passed away while on the job in the marine department of the Exchange in San Francisco. Death claimed an "institution". Jerry Daily had forty years of active work with the maritime life of the world. It is said that he never missed a "turn of the wheel", and that was the truth of his type.

As death stood by Jerry was at his familiar desk, delving in records he had kept for two-score years, doing an every-minute duty of disseminating information. The Master interrupted the spelling of the name of some far-port vessel approaching the Golden Gate.

You may be sure that friendly pilots were on hand to guide Jerry Daily to his final berth. World shipping has lost one of its most faithful chroniclers.

NOTE: J. M. Daily, manager of the marine department of the San Francisco Chamber of Commerce, died on July 10, after forty years' connection with the San Francisco marine exchange.

ping Board; W. F. Gibbs, of Gibbs Bros., Inc.; C. A. McAllister, vice-president, American Bureau of Shipping; John F. Nichols, chief engineer, Newport News Shipbuilding & Drydock Company; Commander S. M. Robinson of the Bureau of Engineering, United States Navy; Major W. D. Styer of the Engineers Corps, United States Army.

This is a strong committee with ample knowledge and experience for the job in hand, and since the policy is apparently settled, the funds available, and the desired result well within the limits of present marine engineering practice, we should see prompt progress on this program.

Drive on Fines

THE Federal Departments, under orders from Washington, are carrying out a "Drive on Fines." This means that in every phase of business under every possible technical pretext American citizens are being subjected to needless annoyance, delay, and expense.

In marine transportation this "drive" has become especially burdensome. The American shipowner is subject to the confusing and sometimes conflicting rules of a number of absolutely separate and non-cooperating Federal bureaus and also to many widely varying state and municipal regulations. Practically all these rules and regulations are drafted with a desirable objective in mind, but too often they are applied solely with the object of getting the fine. It is bad enough normally, but when a "Fine Drive" is ordered the shipowner might as well throw up his hands, turn over the combination to the safe, and run for the tall timber.

There is one feature, however, that galls the private shipowner worse than the loss, the delay, or the annoyance. He has to stand by and watch the Shipping Board "get away with murder," while he is fined at every turn of the wheel. It is high time that the navigation laws of the United States be stripped of obsolete measures, brought up to date, unified, and codified.

The American steamship associations, both Pacific and Atlantic, have strong committees working on this problem. The various merchant marine functions now scattered among a number of Federal Departments will gradually be brought under the control of the Department of Commerce and if Congress will listen to reason we should have no difficulty in framing a simple code calculated to expedite the movement of our ships in coastwise and offshore commerce.

Shipping Board in Europe

IN line with the general consolidation policy adopted by President L. C. Palmer of the Emergency Fleet Corporation, it has been decided to place all European activities under one coordinating head, and on account of the importance of this position it was felt that a vice-president of the Emergency Fleet Corporation should be chosen for the post.

Accordingly Joseph E. Sheedy is to take charge of all European activities. No better choice could have been made, and we congratulate President Palmer on the wisdom of this appointment. Mr. Sheedy was in charge at London for a considerable period two years ago, and at that time gained an intimate acquaintance with British shippers and British shipping pratique. This knowledge will now be of great benefit.

Mr. Sheedy will, of course, retain the men now in charge and the various representatives of the United States Lines, who are making very satisfactory progress as getters of business.

Mr. Sheedy, with his family, left New York on July 26 and will be in full control of all United States Shipping Board vessel operating activities for the whole of Europe, effective with the date of his arrival at London.

The Pacific Coast has always felt a strong personal interest in the career of Joseph E. Sheedy, and we now extend our congratulations on the new appointment. More power to him under the added responsibilities!

The Sailors' Union

SOME time early in the last century, the late John Stuart Mill wrote a pamphlet to show that "all workingmen are liars." Workmen have progressed since the days of the "master economist" and they have organized. The progress of workingmen during a hundred years has led to some of the most beautiful and helpful developments in our modern American life. The organization of workmen into trade unions has undoubtedly had a large share in hastening that progress; it has also been a factor in emphasizing certain very harmful features.

The chief weapon used by the unions is propaganda. The majority of this propaganda, and this is particularly true of the Sailors' Union of the Pacific, is directed toward maintaining the trade union position that all progress toward betterment in conditions of work is due entirely to trade unions and to the efforts

THIRTY-FIVE YEARS AGO

THE ram for the cruiser San Francisco, recently cast of open hearth steel at the works of the Pacific Rolling Mills, is a most successful and perfect piece of work. The outline is smooth and the faces true. The casting contains 13,000 pounds of steel after trimming. The sinking heads above the casting, two in number, were 18 by 24 inches, and the pit in which the mold was built measured 20 by 25 feet on the sides and was 8 feet deep.

The largest Siemens-Martin open hearth steel furnace in this country is located in the plant of the Pacific Rolling Mills Company. There is maintained at the works a complete laboratory for the analysis of metals and materials, and the processes throughout comprehend all that the best modern practice affords.

Steel castings of the finest quality "without flaw or failure" have now been made here for two war vessels, calling out from the Navy Department at Washington the statement that "especially has the steel made on the Pacific Coast been notable for its quality." Reproduced from The Journal of Industry, December, 1889.

of union leaders. In this propaganda the union leaders have been able at various times to enlist the help of so-called expert economists in our universities.

An excellent example of this is to be found in "The History of the Sailors' Union of the Pacific," by Paul S. Taylor, instructor in economics, University of California. This book undertakes to show by a decidedly biased, one-sided account of the story of the American merchant marine on the Pacific Coast that the efforts of the Sailors' Union, and those efforts alone, are responsible for any good that there is to be found in the present condition of the marine workers. Apparently no attempt has been made by the author to investigate the matter through the great sources of information available in the files of the shipowners' organizations.

Although published late in 1923, the story apparently stops about 1917, and it certainly does not cover in any way the developments of the last three years, developments due entirely to the organized activities of the shipowners of the Pacific Coast, and developments which have been of very great benefit to the marine workers.

The manuscript of this volume was offered to Pacific Marine Review for publication; we refused it with much the same comment as here appears. We are bracketed in the preface as having assisted the author with "helpful criticism." Our criticism, as always, was given in the spirit of constructive helpfulness. In this instance, however, it apparently failed to "take."

MERCHANT MARINE IN WORLD TRADE

(Continued from Page 401)

I trust that Congress will let it be known in unmistakable terms that it will support our merchant marine, both privately and publicly owned, as strongly as foreign governments support their nationals in the shipping business; and that there may be developed a definite and continuing merchant marine that will encourage our operators and investors to purchase and maintain the lines now controlled by the government.

We have no desire to take over the carrying trade of the world, but we must have our share on our own routes, and such share must be commensurate with our national importance and with the volume of our foreign trade, even though this may mean some commercial readjustment abroad.

RENEWED OCEANIC LINER SIERRA

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wall finish in the majority of the public rooms. In the lavatories and bath rooms the partitions and sides are largely finished in Nevasplit Unitile.

Metal bedsteads finished in mahogany, oak, or other natural woods, or in enamel colors to suit staterooms, were supplied largely by the Simmons Manufacturing Company. This company also furnished many special mattresses.

Including materials and fittings furnished by the owners, the overhauling and reconditioning of the Sierra cost well above half a million dollars. She left San Francisco for Sydney on July 8, one of the best equipped and fastest passenger liners on the Pacific Ocean, in connection with the steamers Sonoma and Ventura, which will make possible a sailing for Australia every three weeks by the Oceanic Steamship Company.

MARINE STANDARDIZATION

Eight Sub-committees of the American Marine Standards Committee Organized and Ready for Work in Cooperation with the Division of Simplified Practice of the United States Department of Commerce

SEVEN of the committees of experts in marine construction and operation in various phases have held their first meetings to begin studies preliminary to efforts to improve American shipping through greater standardization and simplification under the supervision of the Division of Simplified Practice, Department of Commerce, which is cooperating with the American Marine Standards Committee in this effort.

The first meeting took place in the offices of the Emergency Fleet Corporation in Philadelphia on the afternoon of July 21. This committee is studying "Gages and Instruments", and its aim is to recommend for adoption, as marine standards, types and sizes deemed essential for marine service. The chairman of the committee is J. C. Shaw, assistant chief engineer of the William Cramp & Sons Ship & Engine Building Company, Philadelphia. Other members are: Charles C. Brush, assistant engineer of the United States Bureau of Lighthouses; H. B. Nickerson, vice-president of the American Schaeffer & Budenberg Corporation, Brooklyn, New York; R. P. Brown, president of the Brown Instrument Company, Philadelphia; Lieutenant Commander C. S. Gillette, Bureau of Engineering, United States Navy; E. F. Mueller, assistant chief of the heat division, United States Bureau of Standards; W. D. Frayne, Department of Maintenance and Repair, United States Emergency Fleet Corporation, New York City; and W. D. Fletcher, technical assistant Standard Transportation Company, New York City.

On July 22 in the same offices, the committee on "Cargo and Oil Tight Hatch Fittings" met in the morning, and another committee, to study "Cargo Booms—wood and steel—Boom Fittings and Miscellaneous Deck and Rigging Fittings", met in the afternoon. The former committee is headed by J. W. Hudson, naval architect of the Sun Shipbuilding & Dry Dock Company, Chester, Pennsylvania. Other members are: E. L. Stewart, naval architect of the Standard Oil Company of New Jersey; W. R. Bean, assistant naval architect of the New York Shipbuilding Corporation, Camden, New Jersey; H. H. Thayer, consulting naval architect, Philadelphia; Commander H. S. Howard, Bureau of Construction and Repair, United States Navy; Arthur Aldrich, chief hull draftsman, Baltimore Dry Dock Plant, Bethlehem Shipbuilding Corporation, Ltd., Baltimore; W. D. Fletcher, technical assistant, Standard Transportation Company, 26 Broadway, New York. The personnel of the Committee on Cargo Booms includes: Chairman, John C. Craven, naval architect, Federal Shipbuilding & Dry Dock Company, Kearny, New Jersey; E. C. Gillette, superintendent Naval Construction, United States Bureau of Lighthouses; W. B. Caswell, hull inspector, Southern Pacific Company, New York; W. R. Bean, assistant naval architect, New York Shipbuilding Corporation, Camden, New Jersey; J. W. Hudson, naval architect, Sun Shipbuilding & Dry Dock Company, Chester, Pennsylvania; A. B. Brown, naval architect, Sparrows Point Plant, Bethlehem Shipbuilding Corporation, Ltd., Sparrows Point, Maryland; Walter L.

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TRADE AND TRAFFIC TRENDS

A Department Devoted to the Interests of Exporters, Importers, and All Ocean Shippers

A PRACTICAL SOLUTION OF THE STEVEDORING PROBLEM

By F. P. FOISIE*

The Title Assigned for This Paper by the Officers of the National Foreign Trade Council Assumes That a "Solution" of the Stevedoring Problem is in a Way to be Achieved on the Seattle Waterfront. However, All That is Claimed by Either the Longshoremen or Employers There is that They Have Found the Right Direction and Have Made Progress Beyond Their Expectations, But no Illusions are Entertained that a "Solution" is at Hand.

CARGO handling on the Seattle waterfront was carried on for many years under conditions of intermittent industrial war, the result of distrust, misunderstanding, and conflict of interests between longshoremen and dock workers and waterfront employers. Beginning in 1908 up to 1920 there was a succession of strikes due to the swing of power from one group to another, the uppermost group becoming the dictator during its control. These strikes were severe and prolonged, resulting in great losses of time and money to both employers and employes, leaving bitter memories as well as being a black spot on the industrial life of the community. Ships must move on time; cargo on the docks had to be lifted and men recruited to fill the places of those who struck, which only added to the surplus of workers when a period of truce finally came.

Conditions have changed since 1920. Out of chaos and strife order and peace have prevailed for four years. A joint effort of intelligent cooperation of men and management has replaced these unstable and unsound conditions.

In the hope that our experience and accomplishment during the past four years may be of value to men and employers of other ports, the Waterfront Employers accepted the invitation of the officers of this convention to present our experiment.

Stevedoring is an important link in the chain of transportation, and one that has been looked upon in all ports of the world as a "problem"; a problem of the ship owner and operator because a stoppage of work for whatever cause means delay and results in operating losses; a problem to the buyer and shipper because of non-delivery, damage and pilferage; and a problem for the worker because when he stops working he stops eating.

Delays, strikes, damage, pilferage—all these characteristics of stevedoring have been accepted as inevitable. They are not inevitable; stevedoring can be a stepping-stone instead of a stumbling-block to trade and can be carried on with dispatch, certainty and economy.

The importance of stevedoring is seldom realized. Studies of certain trans-Pacific shipping costs revealed that 10 to 25 per cent of a ship's total operating expenses consisted of charges for loading and discharging cargo. That is, the cost of loading a ton of cargo in Seattle and unloading it in an Oriental port is from one-tenth to one-quarter of the total cost of transporting it across several thousand miles of the Pacific Ocean. Another evidence of the importance of this essential cog in the machinery of transportation is that a ship spends about as much time in port as at sea. Nevertheless, loading and discharging vessels have traditionally been given small consideration in marine matters.

A growing realization of the importance of stevedoring together with the necessity of maintaining industrial peace led the Waterfront Employers of Seattle and the longshoremen and dock workers in 1920 to adopt a plan of industrial relations which has proved sound in policy, though open to improvement in detail. The plan received its inception from an organization started by the Pacific Steamship Company which formed a "Dock Council" patterned after the shop-committee plan. The Dock Council is a legislative body of representatives of men and management where all matters of common interest are decided by equal voting power. The success of the Dock Council as a one-company, one-family organization was almost instantaneous, with an unbroken record of progress ever since. In extending a similar plan to the waterfront as a whole, the effort was complicated by the fact that there were twenty-three steamship, stevedore and dock companies, with the necessity of coordinating their independent interests; further, both union and non-union men were employed.

The empolye representation plan has proved to be a common meeting ground of longshoremen and employers. Neither the closed shop nor the open shop ever were, for these represented alternating periods of control, now the employes being on top, then the employers. Today on the waterfront there is equal sharing of control. The habit is well developed of seeking common interests wherever possible, rather than trying to find points of conflict.

Decasualization

Longshoring is perhaps the most casual of industries and the adage that "casual work makes casual workers" seems to apply particularly to waterfront work. Experience has taught longshoremen and employers to believe that there is no way of avoiding the extreme fluctuation in labor demand; the public also takes it for granted. But the Seattle waterfront experiment has demonstrated that there is an answer to the extreme variations. In the effort which began in March, 1921, covering a period of more than three years, the present 900 longshoremen and dock workers together with twenty-three waterfront companies in Seattle have succeeded in decasualizing the beach. Decasualization seems to be the one word which explains the entire process of regularizing the rise and

* Address by Industrial Relations Manager, Waterfront Employers of Seattle, before Eleventh National Foreign Trade Convention.

fall in demand for longshoremen to load and unload vessels with skill and speed.

Seattle, in common with most waterfronts ,was flooded with "floaters" and again, like most waterfronts, the work was and is extremely irregular; in waterfront parlance, "a feast or a famine". Beatrice Potter (Mrs. Sidney Webb) as far back as 1887 wrote: "The London docks are the scape-goat of competitive industry," and all waterfronts have been described as the last resort of the "down-and-outer". A survey established on the Seattle waterfront in the fall of 1920 yielded information on waterfront labor conditions which is probably unique in longshore experience. The survey disclosed the need of two basic policies which have become the central points of the employment system; they are, "no unnecessary men" and "equalized earnings".

No Unnecessary Men

The first need was to eliminate the surplus men. To determine the point at which the principle of "no unnecessary men" should be applied was extremely difficult; it may never be done exactly, but it has been done approximately. In September, 1920, 1420 longshoremen were registered as eligible workers; by August, 1921, this number was reduced to 612. The machinery for this reduction was developed out of the Joint Organization Plan, the constitution of which provided for a joint executive committee of fifteen men elected by secret ballot and fifteen representatives of employers; also for three joint standing committees, each of four men and four representatives of employers. Of these standing committees, the joint employment committee is in charge of all matters on employment and the conduct of the Dispatching Hall; the joint standard practice committee handles operative problems and questions of hours and wages; and the joint safety committee devises methods of reducing risk and preventing accidents.

The task of decasualization fell to the joint employment committee, which, using the existing central registration system, adopted the device of preventing the return of the floater who had drifted away from the waterfront. This left available the steady men, mostly men of family. The surplus was further reduced by eliminations based on deliberate examination into every man's qualifications, including length of service on the "beach", family status, and skill. The men who were retained had a claim on the industry and were competent.

Of the steady body of skilled longshoremen remaining after the elimination, two-thirds are married, four-fifths are citizens, some 25 per cent own their own homes, a majority have telephones and the number who cannot read or write is negligible. The net result is that, contrary to the popular impression of longshoremen, the men in this port are useful citizens, skilled workmen, and potentially a safeguard to the city instead of an economic menace.

Equalized Earnings

So much for the policy of "no unnecessary men". The companion principle is "equalized earnings". It is characteristic of waterfront work that a favored few make very high wages; the main body of the men earn a moderate amount and a considerable group on the fringe must supplement their meager earnings to exist. This is an unwholesome condition for any industry; in Seattle it challenged the Joint Organization to cooperative effort, which resulted in a plan to equalize earnings that came to be called "gang system".

Longshoremen, like other men, want a sure job and steady earnings; without confidence in regular and satisfactory earnings there can be no stable body of workmen. Also a majority of men want equalized earnings, although there are, of course, some "job hogs", also some men who do not want to work regularly. On the other hand, employers need to have available day and night enough experienced longshoremen to discharge and load ships with dispatch and the great problem is to provide a labor reserve sufficient to meet the extreme fluctuations already noted without creating a surplus.

Gang System

Under the new system, which seems to meet this situation more adequately than any other, two kinds of permanent gangs were formed: company gangs, selected by and working for a single company, getting first call on such company's work; and hall gangs, formed by the joint employment committee and held in reserve at the central dispatching hall available to meet the needs of all companies. Each company selects as its own as many gangs as it can assure reasonably steady work; after that all companies use the same reserve of gangs to meet their peak needs.

Orders for work on the many ships and docks on the waterfront are placed through a central dispatching hall. Before placing such orders, the several stevedore and dock companies have collected information beginning with wireless reports of ships' arrivals, stowage plans, kind and quantity of cargo, its distribution by hatches, ship's gear, time and place of docking, and the consequent number of longshoremen needed. Men are ordered and dispatched by gangs, made up always of the same men, and on the basis of low-earnings-gang first.

The system has been in effect long enough to disclose its strength and weakness. Demonstrated advantages are these:

1. Each man has a sure, steady job in his gang, from which he is "fired" only for cause.
2. Earnings of gang men are equalized.
3. It is easier to arrange for enough men, without surplus, by gangs than by individuals.
4. Responsibility for satisfactory work is better fixed in the steady gang than in shifting individuals.
5. There is a regular supply of skilled men available for work, and obligated to take it as it comes.

The weaknesses developed are apparently in the operation rather than inherent in the system. To correct them requires further cooperation between men and management, which is steadily developing. The outstanding weakness is that some men abuse their security of job by deliberately slowing down and in other ways failing to cooperate. Contrasted with this security in the method established on most waterfronts whereby men are picked almost daily for the job and where fear of the loss of a job is a constant goad to production. The abuse of security would seem to be met by the development through cooperation of some system of incentives for better work.

Additional Advantages

While the gang system is of major importance, it is only one of the advantages made possible through the Joint Organization Plan. Time does not permit more than a mere listing of other interesting achievements:

1. Men are not required to waste their time awaiting a job; the Dispatching Hall notifies them in advance.

2. The Dispatching Hall is becoming the central pay-station at a saving of time and convenience to the men, also to the employers.

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THE PROBABLE EFFECTS OF SECTION 28 ON PACIFIC OCEAN RATES

By PROFESSOR PETER C. CROCKATT
Transportation Division, Department of Economics, University of Oregon

IT is not the purpose of this article to describe the various complicated questions which have arisen regarding the enforcement of Section 28 ever since its adoption in the Merchant Marine Act of 1920, except as to the effects which might be expected on Pacific Ocean rates if the Section went into effect. It is hard to segregate, on the other hand, the various political, national, sectional, and other questions from the rate question, and accordingly where necessary there will be indicated a few of the larger questions involved in the rate problem.

Much has been made of the experience of Germany in its use of preferential railroad rates, as an example for the United States to follow in the enforcement of Section 28. In 1890 and 1915, respectively, the German government instigated preferential railroad rates for goods exported from interior points in Germany to the Levant and to East Africa, via the German-Levant Line and German-East Africa Line. The purpose of these special rates was to encourage German export business and shipping primarily in competition with the British export and shipping to these points. In this purpose there is a difference from the proposal of Section 28 in American foreign trade and shipping policy.

In the first place, there are no practical competing coasts in Germany as compared with the competing Atlantic, Pacific, and Gulf coasts in the United States to render a national problem of discrimination. Furthermore, practically all of the railroads in Germany are state owned and, therefore, the government deals with the ships in rate matters and no competitive traffic arrangements such as occur in the United States between railroads and shipping companies are to be considered. Again, distances in Germany are short, and there is a relatively simple rate structure based upon distance and cost of service as compared with the long distances in the United States, and the necessity for the violation of the distance principle in rates to place coasts, cities, and railroads in conditions of parity. Another point to be considered is that the nature of the export and import traffic in Germany is subject to considerable control by government-encouraged buying and selling associations.

French Experience

Not much has been said about the experience of France in the use of preferential railroad rates. The French experiment has not been very favorable to Section 28. The purpose of the preferential railroad rates in France has been primarily to give employment to ships which have received a large degree of aid and subsidy under the extensive aid plans of the French government. It is well known that the French people have not made a success of their policies of government aid, although they have used almost every kind known. On the other hand, Japan, which has largely followed the French methods and paralleled the French dates of inception, has had more or less success.

Preferential railroad rates in France cannot be condemned primarily because of the experience there. Other conditions which have contributed to render such aid negligible are the old policy of the French government to encourage a number of small ports which have not been properly coordinated with the new location of industry in France and the fact that with the sailing ship becoming obsolete for trans-Atlantic service, the trade routes swept past the French ports into Germany and Holland. Furthermore, the French military ideas of strong arm methods for the building of a merchant marine have been carried over from periods around the 'seventies when conditions were different from what they are today. France has few bulky raw materials with which to fill up ship space and so hold ship lines with home ports in France. In conclusion, the criticism leveled by French shippers against the French preferential rates is that the service of French ships has been too inadequate to warrant taking advantage of the lower rates.

Retaliation

One of the first effects to be expected from the enforcement of Section 28 is retaliation from other countries. Certain it is, however, that so far as our chief competitors are concerned, Britain and Japan, there can be no real effective preferential rail rate retaliation, for these countries have no interior to speak of. As for the other Pacific countries such as China, Australia, and New Zealand, the first two have a small ship tonnage and backward interior development and the last has no interior. Canada is in a position to retaliate by preferential railway rates, and to some extent has been interested by the Dominion acts in maintaining equal treatment to Canadians at British Columbia ports as given Americans at Puget Sound ports.

The forms open to adoption by the leading competitors are several. Outright rate cutting in the case of subsidized lines is a probability in Japanese policy in view of the history of her subsidies, her whip-hand control on conference rates before the war, and the present international difficulty on immigration. It is true that while Britain has never subsidized her general cargo carriers, she has used and is using indirect aids and subventions in loans with low interest rates, colonial and postal subventions, naval and cadet subventions. These are all and have been scientifically and steadily applied under her excellent non-partisan semi-official Board of Trade.

We could learn from British methods. Her shipping does have national backing, but on sound principles. It is not likely, however, that a general subsidy would be given to enable her cargo carriers to retaliate on the Pacific in the rate cutting. Lower operating costs in the case of Japanese and British ships may make for rate cutting, but so long as the effect of Section 28 would be to force the foreign carriers at American Pacific ports to absorb the difference between the domestic rate and import or export rail rate, more effective rate cutting would occur by moving to the Gulf and Atlantic ports.

Trade and shipping combinations, protective tariffs and imperial preferences, purchases made in competitive markets instead of in the American are all possible as retaliations, and to the extent that such practices have been used are probable. Furthermore, the fact that approximately 90 per cent of the shipments for foreign purchasers are designated as to route

shows the probability that in national feeling shippers will order through Atlantic or Gulf ports as against Pacific and thus affect levels of Pacific rates through lack of volume.

Rate Discrimination

Then there are the problems of rate discrimination arising out of departure from the published or accepted services included in the rates. At present the Interstate Commerce Commission has control over the various incidental transportation services through the railways agreements with foreign shipping lines. But if these are abrogated through no through quotations being made, the question of absorption and discrimination of interior and port charges will come up. Not only will it occur at the American ports, but in the interior of Pacific countries there will be opportunity for favorable discrimination in the distribution and collecton charges on such goods as will not come or go by American ships, through the condition of superior information by certain nationals of interior trading methods. This has been done in past conference and rate wars in goods destined for, or originating in, African interior points. There is no international body to regulate these important discriminating practices.

Effects on Conferences

Serious consequences in the history and organization of Trans-Atlantic Conferences will probably occur if Section 28 is applied. The United States Shipping Board, which has been instrumental in reorganizing old, as well as instituting new, conferences will undoubtedly withdraw from these and any other course would render it as an undesirable element in Trans-Pacific Conferences, for its rate discrimination would overthrow one of the first principles for which these conferences are established; namely, rate stabilization and equality. The primary purpose of Section 28 is to fill up American ships with cargo by rate discrimination. This would also mean the destruction of a more or less satisfactory arrangement existing between the northern and the southern Pacific ports of certain cargo and business which seem to belong naturally to these districts, and which division is to a large degree sustained by the present distribution of foreign and American lines at these two sets of ports. Furthermore, the foreign lines which elected to remain on the Pacific would, in all probability, practice rebating, along with other methods as a means of attraction of business to their lines. Rebating practices have been common on the Pacific. In the first place, the very basis for the conference rate on the Pacific being governed by the actual and potential [illegible] of competition from the Atlantic ports for business to the Orient would be disturbed and by the addition of the foreign lines to the Atlantic ports the zone of competition would be pushed further eastward into the Pacific, thus cutting down the territory over which the Pacific Conference or Pacific rates could control.

The railroads have given contracts with shipping companies which would have to be set aside. Through quotations by Section 28 being utilized only as American lines were available will mean the railroads will cancel the preferential contracts now existing with lines. It is true that some of the northwestern-continental carriers, like the Great Northern and Milwaukee systems, have given most of their business to foreign lines like the Osaka Shosen Kaisha line. It was brought out at hearings recently that these two railroads gave only 4954 tons to American ships and 75,188 to the Japanese ships. It seems that the rule of substantial or similar arrangements made with American companies as made with the foreign companies—in other words, an application of some of the principles of the Panama Canal Act of 1912—would remedy this condition.

Instability of port charges with their effects on the rate levels absorbing or including port charges will probably result from those foreign lines which might elect to stay on the Pacific. The construction and maintenance of port facilities, particularly on the Pacific ports which have had large expenditure of public funds since the war, will mean a cost reflected in varying proportions in rates if the use of ports is to be made dependent upon the adequacy or inadequacy of American tonnage.

A few technical details will be affected by the application of Section 28, such as the time given to railroads for filing and publishing rate changes. Section 6 of the Interstate Commerce Act has not been amended in this respect and, therefore, must be considered by the United States Shipping Board in applying Section 28. Furthermore, the rules in details for policing of shipments that go on import, export and combined domestic rail and water rates will have to be carefully worked out. Transit privileges accorded through shipments will mean careful policing of such goods as take these privileges, and those at the docks, wharves, and terminals which do not take these privileges.

Grain Shipments

A large part of our exports of grain move by rail under transit arrangements which permit of elevation, storing, grading, or other treatment within a limited period, as, for instance, twelve months, at a transit point and forwarding on the balance of the through rate in effect at the time and from the place of original shipment. Now, suppose Section 28 were applied Grain would move in the same train from the same elevator to the same port under an export rate as other grain moving at the same time in the same way, contracted for when the domestic rate was in effect. The difficulty of policing such a situation at the port elevators is evident. Grain dealers at the primary market name prices to foreign purchasers on grain delivered at the port. The purchaser arranges for the vessel and the dealer cannot at the same time tell whether a foreign or an American vessel will be used. The United States Shipping Board would of necessity have to keep in hand adequate tonnage for grain shipments at all times, for the opposite would mean a confusion in contracts and prices resulting from the variation of rates between the inadequate American tonnage and the additional foreign tonnage. This problem has led the United States Shipping Board to exempting grain from Section 28 in its recent program.

It is evident, then, that the probable effects of Section 28 will be disturbing upon the rate structure of the Pacific. On the other hand, it may be pertinent to inquire if there may not be other and better ways of accomplishing the same purpose of building up a profitable and economic American merchant marine.

MARINE OIL ENGINE AND MOTORSHIP PROGRESS

DIESEL ENGINE PROGRESS IN GREAT BRITAIN

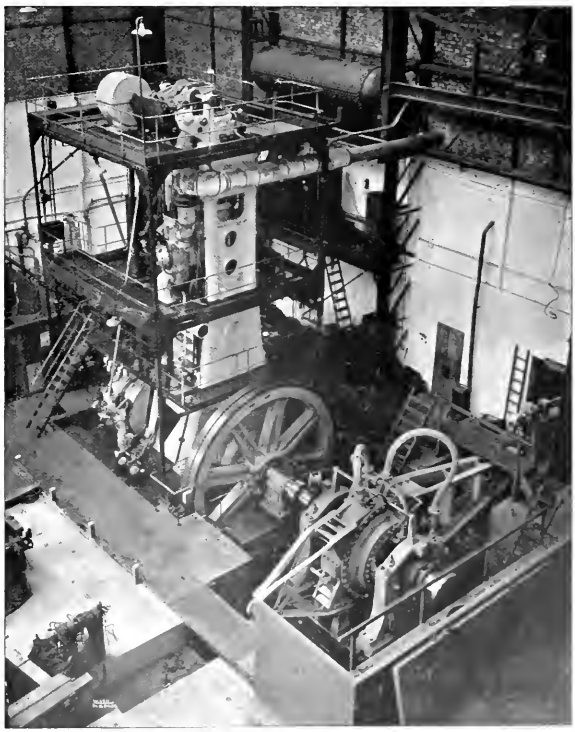
At the Marine Transport Section of the World's Power Conference, held recently at the British Empire Exposition, it was shown that 50 per cent of the tonnage now under construction and on order in the world's shipyards is for diesel propulsion. The United States is just waking up to the importance of utilizing this most economical power for marine transportation. J. S. Hines, publisher of Pacific Marine Review, has just returned from a trip through Western Europe and Great Britain, during the course of which he personally investigated the more prominent diesel engine manufacturing establishments, making arrangements for authoritative and up-to-the-minute articles on European diesel engine developments. The present article hits a few of the high spots of recent developments in Great Britain. It will be followed by a series showing developments in Western Europe.

PRACTICALLY every marine engineering firm of any importance in Great Britain and Ireland is now developing a form of diesel engine for marine propulsion. The owners of ordinary plain cargo vessels still deem motors of the type to be too dear for their particular purposes, although the fuel economy of the oil engine is agreed to be convincingly superior to that of the steam engine. One objection is that for tramps convenient supplies of fuel oil are not always available; but a more effective contention is that the first cost of diesel engines is much too high.

The initial expenditure is, it is true, rather high, and will continue to be so until oil engine manufacturing becomes the larger part of our main engineering activity. It seems to stand to reason that if a firm has ten or a dozen sets of diesels in hand, it can produce them at a less price per set than if only one or two sets are in progress in its works.

Doxford

The difference in the first cost is not, however, so great as it is sometimes assumed to be. The Doxford opposed piston engine — which is very suitable for the propulsion of single screw vessels—is not high in first cost, and its reliability and fuel economy are beyond question. Firms like Furness, Withy & Company have now much valuable data in their possession regarding the running of Doxford engines; it therefore cannot be denied significance in this connection that they are adhering in almost every instance to this particular system of oil engine propulsion.



An experimental double acting [illegible] cylinder Diesel [illegible] Werkspoor type developing [illegible] indicated horsepower. This unit [illegible] level [illegible] at the [illegible] Eastern Marine Engineering Company, Ltd., at Wallsend-on-Tyne [illegible] with the engineers of Werkspoor, Amsterdam.

Harland and Wolff

The objection that diesel engines cost too much to begin with must also have very little point when it is urged against the motors produced in Denmark by Messrs. Burmeister & Wain, and in Great Britain by their licensees, Messrs. Harland & Wolff. Messrs. Harland & Wolff are now building Burmeister & Wain diesel engines of three types—a long stroke engine suitable for single screw cargo vessels, a twin screw type for moderate sized passenger and cargo vessels, and a double-acting engine for large ocean-going liners which in some installations produces no less than 20,000 i. h. p. They are building engines of these types not only in their diesel engine works at Glasgow, but also in their engineering works at Belfast, and at the moment of writing it looks as if internal combustion engines will bulk more largely in their output for the next two years than steam turbines or steam engines.

Messrs. Harland & Wolff are, we should say, at a guess, building four-stroke, single-acting diesel engines at a price which compares favorably with the price of steam engines. This will also, in all probability, soon be the case with the double-acting engine, because at the moment no fewer than seven large liners are in hand which are to be fitted with machinery of the new type. Two of these vessels are for the Royal Mail Steam Packet Company's South American service, two for the Pacific Steam Navigation Company's South American service, two for Messrs. Elder Dempster & Company's West African service, and one for the Union Castle Company's South African service.

Sulzer

Several British firms are developing the Sulzer type of two-cycle single-acting engine for the propulsion of passenger vessels. The Fairfield Shipbuilding & Engineering Company, Ltd., Glasgow, is, for example, building four sets of Sulzer engines, each of 3000 i. h. p., for a quadruple screw vessel, the Aorangi, which is intended for the Union Company of New Zealand's passenger service. This vessel is to be launched in June and her sea work, it goes almost without saying, is being anticipated with great interest by shipping interests generally. Sulzer engines are also being constructed by John Brown & Company, Ltd., Clydebank, who built the Lusitania and the Aquitania, and also by the Wallsend Slipway & Engineering Company, Ltd., which constructed the steam turbines for the Mauretania, and is building the turbine propelling machinery for the new British battleship Nelson.

North Eastern

The North Eastern Marine Engineering Company, Ltd., of Wellsend-on-Tyne and Sunderland, have produced several sets of Werkspoor single-acting diesels, and are now, in association with the Werkspoor people in Amsterdam, working with a double-acting single-cylinder unit developing 1000 i. h. p. This unit has recently undergone exhaustive, extended shop trials at Wallsend-on-Tyne and experts who have seen it think highly of it. A photograph of this new development accompanies this article.

Vickers

Vickers Limited of Barrow-in-Furness are installing one of their solid injection diesel engines in a new Donaldson liner which ought to be ready for service on the Atlantic before the end of the year. Engines of this make have served excellently in several large tankers belonging to the Anglo American Oil Company. It is believed, however, that for the propulsion of liners the famous Barrow firm are of a mind to develop another type of internal combustion engine. Among other firms which are licensed to construct oil engines of the Sulzer type are Messrs. Alexander Stephen & Sons, Linthouse, and Messrs. William Denny & Brothers, Dumbarton.

Swan Hunter

Messrs. Swan Hunter & Wigham Richardson, Ltd., of Wallsend-on-Tyne have installed diesel engines of the Neptune type in several moderate sized vessels whose owners are well pleased, it is understood, with the results from the point of view of both reliability and economy. The Neptune engine is, if my memory serves, a two-stroke type. One of the firms associated with Swan Hunter & Wigham Richardson, Ltd.—the North British Diesel Engine Works (1920), Ltd.—has evolved what is generally described as the most interesting engine of the year. It is a two-cycle double-acting engine in which the bold plan is followed of causing the cylinders to reciprocate through a short distance in order to bring about a simple valve operation. It is being installed in a vessel which is being built for Messrs. Harris & Dixon, London, and its three cylinders develop 2000 b. h. p. at 100 revolutions per minute. The cylinder diameter is 24½ inches.

Cammell-Laird

Cammell-Laird & Company, Ltd., of Birkenhead, have developed for marine propulsion the Fullagar type and a large engine embodying the principle has just been completed for one of the Anglo Persian Oil Company's tankers by one of their licensees, Palmers Shipbuilding & Iron Company, Ltd., Jarrow-on-Tyne. A more interesting application of the "Camellaird-Fullagar" system is, however, to be found in the machinery of three vessels which have just been completed at Birkenhead for the United Fruit Company of Boston. In these vessels four 'Camellaird-Fullagar" oil engines, each of 750 b. h. p. drive, by electric transmission, a single screw. This is the first large British application of electric transmission to marine propulsion and the sea service of the vessels is, as a consequence, being followed with great interest.

Scott-Still

An installation which, though for comparatively small power, is most marked in its departure from orthodox practice, is the Scott-Still twin-screw 2500 b. h. p. engine which is being installed by Scott's Shipbuilding & Engineering Company, Ltd., Greenock, in Messrs. Alfred Holt & Company's Dolius. The propelling machinery of the Dolius is a combination of the oil and steam engine. The oil engine is of the single-acting two-stroke type and steam is used in addition on the under side of the pistons. The jackets and exhaust silencer form, in fact, the water space of the boiler which supplies steam to the main engines, this steam being generated from heat which in ordinary oil engines without exhaust boilers would be lost. For starting purposes steam is supplied by oil firing the exhaust boiler and, as airless injection is used for the supply of air to the engines, air compressors are not necessary.

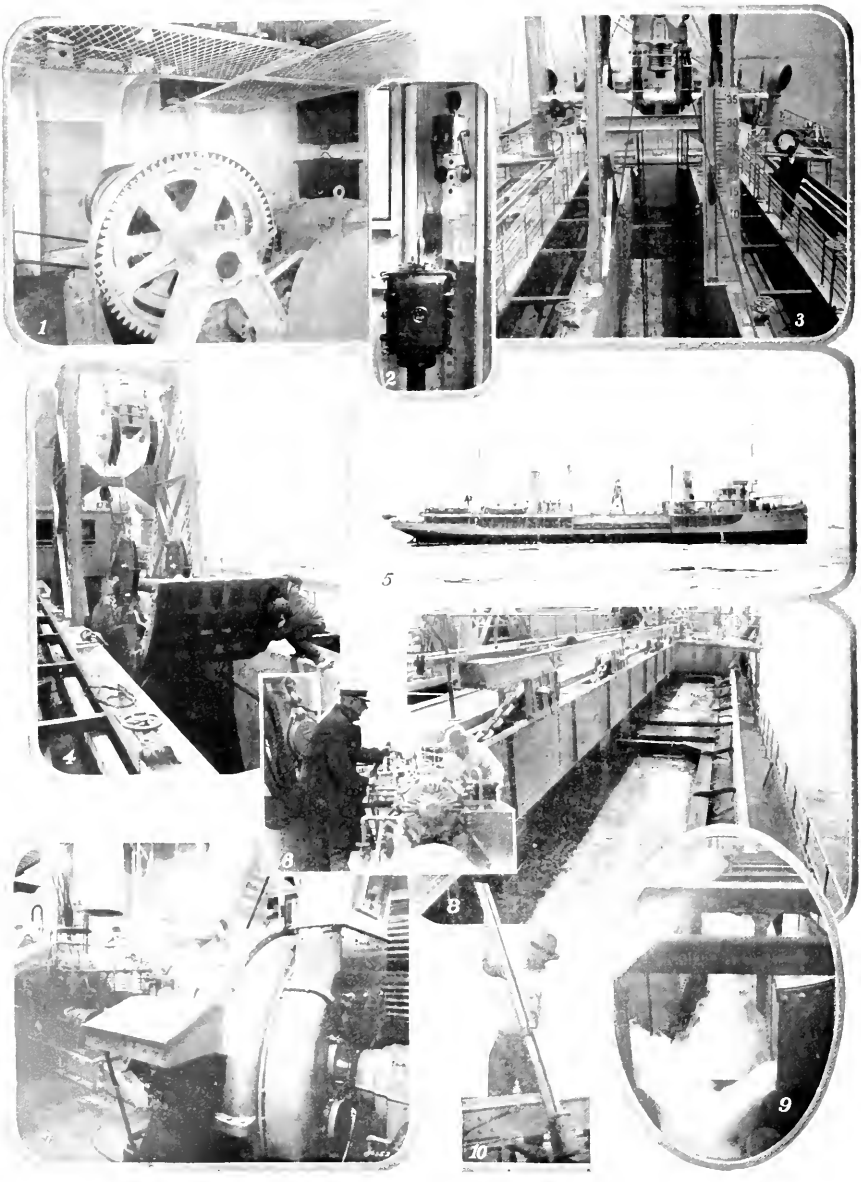
General Shipping Conditions

British shipyards are busier than they have been for a considerable time, although the volume of their activity is much less than normal, and the work which

(Continued on Page 417)

STEAMER DATA WITH A BEARING ON MOTORSHIP PROGRESS

The [illegible] in this table were compiled by Carl E. Petersen for a paper on the economics of trans-Atlantic liners of various lengths, presented before the Society of Naval Architects and Marine Engineers [illegible]. It will be noted that the best financial results are obtained with the 600-footer. Practically all trans-Atlantic liners built recently have been of this class. German ma[illegible] ENGINE PASSENGER LINERS OF THE 600 FOOT CLASS. WE MAY CONFIDENTLY ASSERT THAT THERE IS NO MARINE ENGINEERING PROBLEM BEYOND DIESEL SOLUTION



UNITED STATES DIESEL-ELECTRIC DREDGE A MACKENZIE

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ver 450 r. p. m. motor used for raising and lowering the drag. (2) Control used for raising and lowe[illegible]erations. 3) Looking aft from the drag control room, the indicator shows drag submerged 20 feet. On [illegible]ters. 4) Drag raised for inspection. 5) One of the four United States Engineers Corps' seagoing [illegible] the hopper doors to dump the dredgings. (7) Westinghouse 800 horsepower 480 volt motor driving the [illegible] centrifugal pump at 135 to 160 r. p. m. (8) Port hopper filled with 1000 dredgings, trough where [illegible]. Where the dredgings flow through the gate into the hoppers. (10) Sampling the dredgings for classi[illegible]ation of weight. The capacity of the hoppers 1250 cubic yards, usually weighs about 2000 tons.

MOST POWERFUL DIESEL-ELECTRIC DRIVE

United States Engineers Corps New Suction Dredges Demonstrate Advantages of Full Electrification with Diesel Prime Movers

THE four seagoing hopper dredges at present being completed by the Sun Shipbuilding Company for the United States Engineers Department at Chester, Pennsylvania, are unique in that they are the first dredges of this type to employ diesel-electric power, and also in that they are probably the first vessels of their size of any type to be electrically equipped throughout.

Two of these dredges, the A. MacKenzie and the W. L. Marshall, are finished and ready for service, and it is expected that the Dan C. Kingman and the Wm. T. Rossell will be ready before the middle of August. As the Wm. T. Rossell is to be stationed at Seattle to serve Pacific northwestern ports, a full description and pictures should be of timely interest to readers of Pacific Marine Review.

As will be seen from the illustrations, these dredges present the outward appearance of staunch seagoing steamers. The entire inboard midship section, however, is occupied by deep hoppers with a long narrow open well between, in which is operated the dredge drag and suction, which consists of a steel pipe 26 inches in diameter and 45 feet long, supported in a stout steel framework and terminating in a heavy cast steel grid, which forms a cutting drag to stir up the bottom and add mud, sand, or silt to the suction stream. The upper end of the suction pipe is connected through a flexible joint to the suction side of a centrifugal pump driven by an 800 horsepower Westinghouse 480 volt direct current motor. This pump discharges into the hoppers and when these are full the dredge proceeds to sea and dumps its load.

The principal dimensions of these dredges are: length over-all, 268 feet 5 inches; beam, 46 feet; depth, 22 feet 6 inches; capacity of hoppers, 1250 cubic yards.

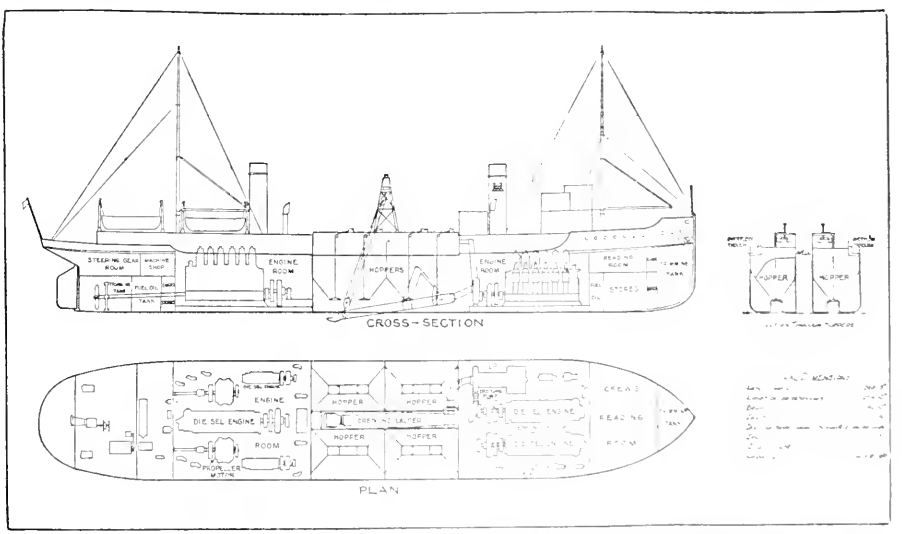
Power Plant

The power units of each dredge consist of three 1000 brake horsepower diesel engines, each direct connected to a 700 kilowatt 500 volt direct current generator, and two auxiliary 225 brake horsepower diesel engines, each direct connected to a 150 kilowatt 250 volt direct current generator.

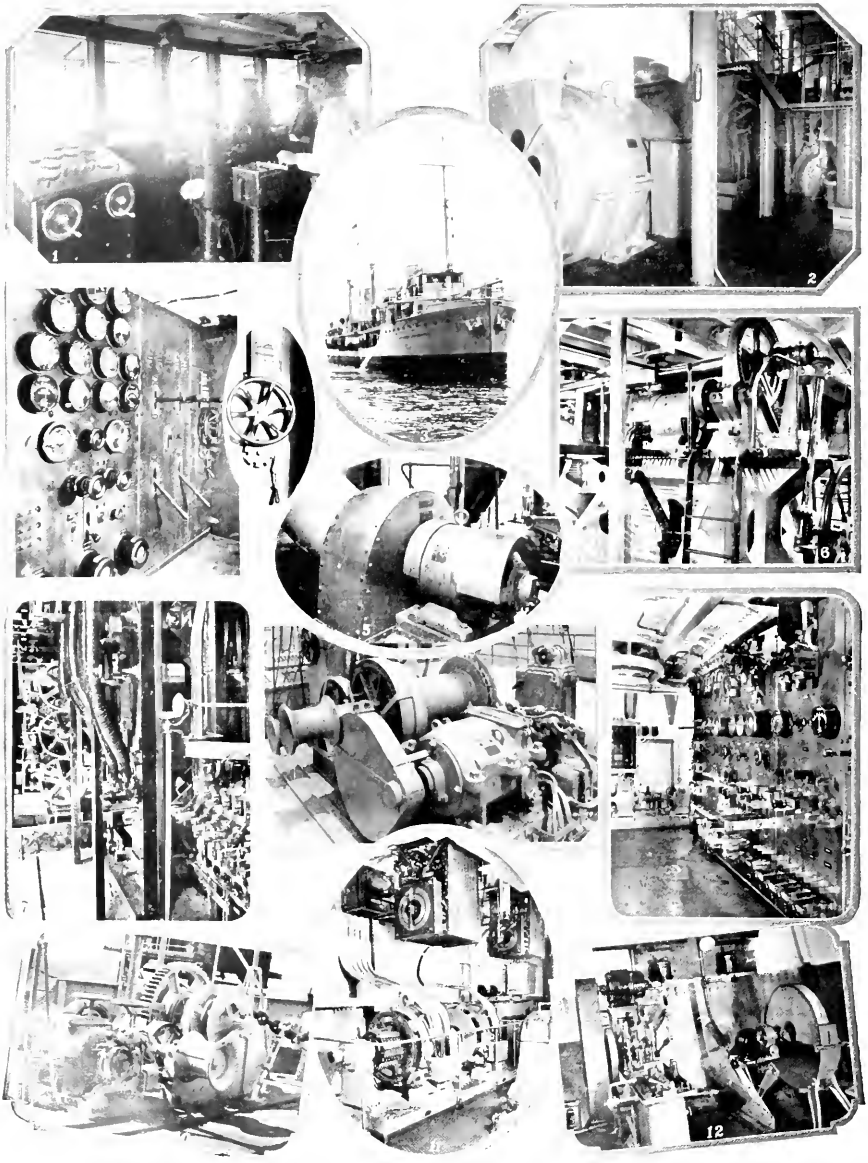
The main engines are the McIntosh & Seymour Corporation's 6 cylinder 4 cycle air injection crosshead piston, marine type diesel engines, developing 1000 brake horsepower at 150 revolutions a minute. The auxiliary engines are of the same manufacture and are 4 cylinder 4 cycle trunk piston stationary type air injection diesel engines, developing 225 brake horsepower at 275 revolutions a minute. The generators are of Westinghouse manufacture.

The power units are grouped in two engine rooms, one fore and one aft of the hoppers, which arrangement makes it possible for the dredge to rest on an even keel, whether loaded or light.

The seagoing hopper dredge, in addition to requiring power for propelling, navigating, and the other operations pertaining to ocean-going ships, requires



Diagrammatic inboard profile and plan showing arrangement of machinery in the new [illegible] dredges [illegible] pany for the United States Engineers Corps.



UNITED STATES DIESEL-ELECTRIC DREDGE A. MACKENZIE

(1) Ward Intosh & Seym... for the propulsio... (3) One of the t... (4) Engine room totally enclosed ... switchboard. (5) We... inghouse motor driven hacksaw are motor drive... Westinghouse systems of pilot house control of the steering and propulsion equipment. (2) One of the three Mc... diesel engines driving Westinghouse 700 kilowatt 500 volt generator at 150 r.p.m. which supplies power ... also Westinghouse 800 horsepower 480 volt double unit motor driving propeller at 90 to 110 r.p.m. ... Engineers Corps' seagoing dredges, A. MacKenzie, built by the Sun Shipbuilding Company, Chester, Pa. ... method of securing eight operating combinations. (5) Sturtevant ventilating fans are used for ventilating ... (6) Electrically controlled and driven American Engineering steering mechanism. (7) Rear view of ... winch motor and control. (9) Power and distribution sections of main switchboard. (10) West... Westinghouse motor generator set for supplying 250 volts for auxiliaries. (12) Even the grindstone and ... equipped machine shop.

power also for operating the dredging equipment and the dumping gear.

The propelling equipment on each of these dredges consists of two propelling motors, one to drive each screw. The motors are of the 800 horsepower 480 volt 90-110 revolutions a minute, double armature, totally enclosed, separately ventilated Westinghouse type, direct connected to the propeller shaft through a Kingsbury type thrust block. The stern bearing is of the McNabb type, lubricated through an oil feeder running alongside and fastened to the strut. The propellers are of the 4 blade built-up type, with manganese bronze blades and cast steel hubs. The propellers are 11 feet diameter and have a pitch of 12 feet 3 inches. The calculated speed of the vessel, in light condition, with the propellers operating at maximum revolutions, is 11½ knots.

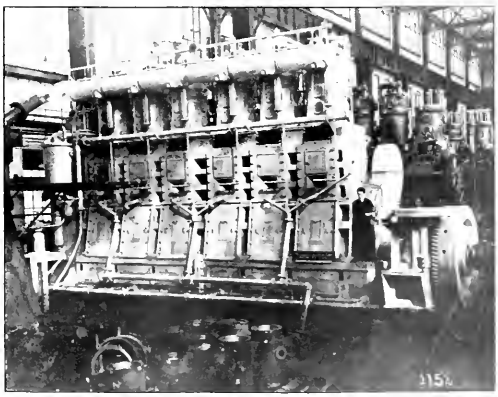
While these motors will generally be operated individually, from any two of the three main generating units, they may be operated in series from any one unit if desired. It is expected that a speed of approximately 11½ knots will be obtained under normal conditions and approximately 9½ knots when propelling motors are in series.

The Ward-Leonard system, with control stations in the pilot house and after engine room, has been adopted for the control of the two propulsion motors. When once connected to a generating unit, complete control of the speed and direction of rotation of the motors may be obtained from either of the two control stations provided.

The control consists of a reversing rheostat, which varies the generator excitation, and consequently the generator voltage, from zero to a maximum in either direction. The rheostat is operated by means of handwheel, mounted on a control panel or desk which carries all the necessary electrical instruments.

Electricity Does All the Work

Nowhere else, afloat or ashore, can so many different applications of electricity be found in so small a space. Electricity drives the propellers, operates the dredge mechanism, opens and shuts the hopper doors, pumps water and fuel oil, compresses air for blowing the whistle, makes ice and maintains cold storage, heats all holds and living quarters, keeps the fuel oil at the proper temperature, ventilates every part of the vessel, runs the machine shop tools, raises and lowers the anchors, operates all winches and capstans, heats the water, does the steering, cooks the meals, and lights the cigars, cigarettes and pipes. There are on each dredge 56 electric motors, 100 electric heaters, 25 electric fans, and 2 electric ranges.



One of the McIntosh & Seymour 1000 brake horsepower 6 cylinder 4 cycle air injection marine type diesel engines for the diesel-electric dredges of the United States Engineers Corps.

BRITISH DIESEL PROGRESS

(Continued from Page 412)

is in progress shows a very small margin of profit. Shipping is also slightly better, but the world's available seaborne trade is still far below normal and the prospect of improvement is not—in the opinion of experts—at all promising. Writing on the outlook in the half yearly review number of Fairplay, a leading British shipowner says: "It must be remembered that the supply of shipping is not constant—the world's trade may have grown considerably in the last twelve months, and, indeed, the value of British foreign trade has increased, but the world's effective fleet has increased, too. Probably in the last twelve months shipbuilding has exceeded shipbreaking and other deductions by about 500,000 tons, compared with 750,000 tons in the last reported figures, and in the countries of low wages, as, for instance, Germany, no tonnage is now laid up."

"As long," this authority goes on to say, "as a mass of effective tonnage is laid up, each rise in freights is likely to be short, as the market will be swamped by vessels put into commission directly owners see a margin over their running costs. This stagnation in shipping is itself one of the great causes of stagnation in British trade. There can be no real improvement either in shipping or in the heavy steel trade or in the hundred-and-one trades allied to shipping by which so large a fraction of our people live, till the owner of the general cargo steamer sees profitable business before him and makes up his mind that the time has come to order new ships before prices rise."

Another eminent shipowner suggests that since the war there has been something almost akin to a panic in respect of diesel engines. "But," he proceeds, "a more sober feeling now supervenes. Diesels are undoubtedly making solid progress and are much nearer their day of general use. Yet the day of the steam engine is by no means over, and owners of steam tonnage are less inclined to throw up the sponge today than they were six months ago. As to the freight position, there is generally a better feeling, the reasons for which must be very deep, for they certainly do not lie on the surface. A spasm here and a spasm there do not make a really improved state of affairs, but perhaps the recent spasm in South American freights, and then in eastern freights, have been of a more healthy character than those previously, which were on several occasions merely due to strikes in this country or in the United States. The wearing down of the old tonnage also continues, and it would appear that the adjustment of the tonnage to trade has reached that border-line state when tonnage is so ample that, on the whole, no recovery of freight is possible, but is not so redundant that a lot of useful tonnage has to be laid up."

AUXILIARY YARNS

Some Stories of the Days When Equipment Was Chiefly Noticeable on Account of Its Absence

THE following collection of tales reflects the functioning of equipment at sea in the "middle ages" of steam. The stories were selected at random from the Editor's correspondence with old timers.

Floating Top

The old timers in American steamers always called the head valve of the air pump the "floating top." As to why, the writer was at a loss for a great while, when he at length found what he believes to be the origin of the term.

On some of the light draft paddle wheel steamers, with beam engines, the air pump top was quite a bit above the level of the outside water. The discharge pipe was not a pipe at all, but a trough, leading the discharged condensing water out overboard from a sort of enlargement of the top of the air pump, something like that on a single action galley pump, with open top. As when warming up and at other times if an extra gorge of water came through, it would spatter over this flared top, so a wooden top was made, which fitted loosely around the air pump rod, and floated a loose fit in the chamber spoken of above.

Obviously, this would float when the condensing discharge water lifted it, and from this it is believed the term "floating top" came. It even continued after head valves were well below the water line and also fastened down to the air pump barrel. The modern ones are real valves, and serve a good purpose should the foot valve let go. But the old "floating top" was in no sense a valve. It was merely a guard to keep the water from splashing about.

STEAM JET.

No Ice Without Brine

Some years ago the writer was chief of a Pacific Mail steamer, plying between San Francisco and Panama. Panama was also the northern terminus of many steamers running from Valparaiso and other South American West Coast ports.

One of these latter had a carbon dioxide refrigerating machine, which worked well in the way of keeping the chambers cool, but they could not make ice with her, although a box was contained within the plant providing for a quarter ton of cakes per day. Always they bought ice at Panama and other ports.

One day the chief of the Chilean steam asked the writer to have a look at his plant to see what was the trouble with the ice foundry. He had been told that we made lots of ice on the Yankee boat and wanted to know if I could find the trouble. So the chief went aboard the Chilean. He found that they had a direct expansion plant, with coils for the expanding gas around the ice-box, in which were the ice cans, but there was no liquid to transfer the heat of the water in the cans to the coils. The chief was asked if they had no salt or chloride of calcium to make a brine, and having none, a few buckets full were given him, and the operation of the ice making box explained. The next morning they had ice for the first time in their history, made on board. It is hardly credible that such a thing should occur, but the above is a fact.

CARBON DIOXIDE.

Thumbs Down on Position

Years ago one of the steamers out of San Francisco was commanded by an old time skipper, whose navigation was chiefly of the "89 degrees, 48 minutes" type. (The deck folks will get this.) This old chap had some mighty bright young navigators as mates, and he went a great deal on their work.

However, if a passenger was around, then it would never do to let it be thought that the skipper was not the whole works as to the navigation. One day the skipper was showing a passenger (a lady, by the way), around the ship, and on the journey the chart house was visited. The wonders of navigation were duly explained, and the charming visitor asked the skipper if he would please show her on the chart just where the vessel was at that time.

The skipper had a thumb made broad and flat by many years of service with marlinspike and serving mallet. He placed this on the chart, and said, "She's right there." As it was a small scale chart, the old skipper's thumb covered up some 200 square miles of Pacific Ocean. It was near enough, though, for we were hundreds of miles out in tall water. However, the youngsters often had a quiet joke among themselves about her being "right there."

DIGIT.

Poor Polly, She's Gone These Many Years

Some forty-odd years ago the writer was apprentice engineer on the steamer Coorong, plying between ports on the Australian coast. This vessel was of the old low-pressure, jet-condensing type, with, then, modern, inverted cylinders. Her arrangements for handling were crude, not the least remarkable being that the main stop had to be closed and opened when she was maneuvering for a wharf or anchorage. This was the duty of the writer, who was stationed at the foot of the funnel, on deck, where an extension rod came up through with tee handle to overate the valve. It was my part of the job to watch the bridge, which was not far from my post, and note what signals were sent down to the engine-room, and then to operate the valve accordingly. All this leads up to the story, as the position I was in gave me a chance to observe things happening on deck.

One of the crew was a big Australian cockatoo, white, with a splendid yellow crest, which he would erect in moments of excitement. And he was excited most of the time when we were docking, as noise seems to delight these birds. In addition to a rich vocabulary of sea talk, "Cocky" was always picking up words. One of his stunts was to imitate the orders from the bridge, and then give them at the wrong time. For instance, he would shout "let go forrard," when to do so would be bad for handling. He would also yell "go astern hard," or anything else that came to his bird brain. In fact, while funny, he was a nuisance, and one time came near getting me in wrong, as he yelled, "full speed ahead," at a time when engines were stopped, and the valve was opened, with the result that I got a dressing down from the chief for not attending to business.

However, Cocky went too far one day when he shrieked "all clear aft," and the captain, thinking it was the second mate calling, ordered engine put ahead, resulting in a line fouling propeller. After this Cocky was put into the paint locker when ship was docked.

At sea, though, he had the run of the deck, and it was fun to watch him trying to get forward when a hit of a sea was running, with more or less heavy seas coming aboard. Hanging on with beak and claws, and working toward the bow, a dollop of sea would drench the bird, who then would break out into language more forcible than elegant, much to the delight of those who listened. For years this bird was a feature of the Coorong, and will be remembered by any of those who happened to be on that vessel back in 1880.

P. A. ROT.

Accelerated Day's Runs

At one time in a varied career, the writer had the pleasure of sailing with a splendid captain, who, besides being a fine navigator and shipmaster, had a keen sense of humor. Cruising along the Central American coast, the old man would calculate very closely the ship's day's run several minutes ahead of noon, and then, the instant eight bells was struck, despatch a quartermaster to the chief's room with the sheet, telling him to get the chief's report at the same time. As I had not got on to this little bit of joke I was naturally behind, as the engine room records do not come up to the chief until noon. Then the captain would solemnly ask how it was that he had to wait such a long time for noon reports.

However, knowing the speed of engines was very regular, I gave instructions to have the engine room records sent up at quarter of twelve. An addition of what she should be at noon was made, and the noon report was made out. Then, strolling up toward the bridge, the chief met the quartermaster with the accelerated day's run, and changed reports in full view of the skipper. He saw the joke, and appreciated it. After that we let things go in the regular way, swapping days' runs at the lunch table at 12:30 p. m. But this was better than some I have been with, who would procrastinate and it would be two and three days without a report, much to the grief of anyone who desires a log kept up to the moment.

SEA FLAME.

A Curious Vacuum Problem Solved

Some years ago a small steamer was built and engined in San Francisco by a firm now long extinct. In those days it was customary to have a bilge injection run from a strainer in the bilges to the condenser. Of course this was in a way a "jet injection," though not intended for that purpose, but as an auxiliary in case of a big leak. This will explain what follows.

When first started up, the engines rolled over all O. K. for a few minutes, with a fine vacuum, and then back this went, with a slowing down. The engines were then shut down, and investigation of things begun. Of course it was assumed that the air pump was on the blink, so this was pulled out. All was found in order.

After assembling again, another try was made, and the first performance was repeated. Another stop was made, and a further consultation. It was getting late, and after talking things over a while, it was decided to try again next day, which, by the way was the one set for the official trial trip.

So next morning bright and early, steam was got ready, and a new start made. All ran well for about five or ten minutes, when "bingo" went the vacuum again. This began to look uncanny. All seemed O. K., as there was plenty of injection water going over the side, and condenser was cool. It was noticed, though, that feed was rising in boiler more than it should. Then one of the firemen, who was mooching about back of the condenser, came in front and said there was a steam leak in the bilges, as he could hear it hissing.

An investigation was made, and the hissing was distinctly heard. Delving down we found that the bilge injection suction strainer was "sooping" up air at a great rate. Further investigation showed that the $1\frac{1}{2}$-inch plug cock on condenser appeared shut. However, a shut down was made, and this plug taken out, when it was found that it had been marked wrongly, showing shut when as a matter of fact it was open.

V. A. CUUM.

Telegraph Tales

Not many steamers of the present day are fitted with the old style "gong and jingle." Years ago, though, before the "House of Cory" came to the rescue, bells were the main communication between engine room and bridge. And they were a source of trouble, too. Many a good engineer has been blamed for not answering the bells right, and also many an officer on the bridge has ben censured for mistakes not his own, owing to the failure of the gong to ring, or the inability of the man on watch to hear the same.

But there were many funny incidents connected with these same crude methods of inter-communication, some of which the writer remembers plainly. Perhaps they may be interesting to the younger boys, and it is a safe bet, too, that the oldsters will chuckle when they read.

On the Pacific Mail steamer City of Baltimore the chief engineer and the captain were not on the best of terms. The captain, seeming to know that it bothered the chief, was very slow in giving the "ring-off" after the vessel had come to anchor.

One day the City of Baltimore entered the port of La Union on the Central American Coast. After anchoring, the cargo boats were immediately alongside, and work of discharging commenced. But the engines were not "rung off," and after waiting some minutes, the chief went to the bridge deck to find out why. He saw the "old man" in his room, talking with a shore visitor, and asked if they were through with the engines. The captain called a quartermaster and told him to "ring off." The quartermaster, though, pulled the wrong handle, and gave one bell, which meant slow ahead. This was answered by so working the engines. She soon ran up over the anchor chains, and began to mix things. The mate rushed up to the bridge and was met by the captain, who yelled to the quartermaster, "Ring her off! Ring her off!" This time the man got hold of the right handle to the "jingle" and pulled it. Then pandemonium commenced. The old Baltimore began to haul her anchor through the mud and head for the beach. The captain and mate both tried to get up the flying bridge ladder at the same time. Shrieks and yells from the stevedores rent the air. In a moment, which seemed long, the captain reached the bell-pulls. He sent in a stop bell, and then followed it with a "finish" signal, and all was quiet once more. But it was a good lesson. From then on the captain did not leave the ring off to anyone but himself.

JINGLE BELLS.

PORTS OF THE PACIFIC

IMPROVEMENTS DEVELOPMENTS ACTIVITIES

AROUND PACIFIC'S RIM

Some High Spots in a Huge Program of Port Betterment

Tokio. The construction of Tokio harbor and of a canal between Yokohama and the capital has been decided upon by the Home Department, which will enable coasting vessels and vessels engaged in what is known as "near seas trade" to proceed direct to Tokio, where harbor facilities suitable for their accommodation will be built. Work is to be started this year and will cost 46,500,000 yen ($18,600,000), and will be completed in six years. The plan of construction involves the erection of mooring berths with a low tide depth of 25 feet, which will serve as a breakwater for the harbor. The Sumida River will probably be closed by a wall to prevent siltage, and Shinagawa Bay will be dredged to permit the entry of vessels drawing not more than 25 feet.

Hakata, Japan, has signed a contract with an American firm, the Asiatic Development Company, P. P. Whitham, president, for the construction of a harbor and a railroad inland to tap important coal fields. Hakata is on the Island of Kyushu, near Moji, and the railway will cost in the neighborhood of 11,000,000 yen.

Adelaide, South Australia, is desirous of receiving tenders for delivery and erection of a coal handling and storage plant, according to Commerce Reports. This will involve a supply of traveling hoppers, conveyors, trippers, weighers, conveyor supports, galleries, housings, and storage bins. Specifications may be examined at the office of the Bureau of Foreign and Domestic Commerce, 734 Customhouse, New York City, and 76 West Monroe street, Chicago.

British Columbia. New Westminster, situated near the mouth of the Fraser River, is now being visited by deep water vessels. It is reported that two new elevators are to be built there this year and the Consolidated Mining & Smelting Company has made this port its headquarters for shipping zinc concentrates to Antwerp. Special dredging is to be done this year to give greater depth to the channel.

The Canadian government is planning the construction of a 600-foot wharf at Port Hardy, situated at the northern end of Vancouver Island. The port will be used for the accommodation of passengers and freight vessels in the British Columbia-Alaska trade.

San Francisco. In the first five months of this year 2765 ships arrived and 2799 departed from the Port of San Francisco. The tonnage of these vessels was: incoming, 6,082,576; outgoing, 5,847,902. For the first five months of 1923 the figures were: ships arriving, 2554; departing, 2673. By tons the figures were: incoming, 5,578,393; outgoing, 5,760,709. These reports show a substantial increase in the shipping business for the first part of this year.

The plan to have a 30-foot channel in San Francisco Bay off South San Francisco is being pushed in Washington. The industrial and commercial growth of San Francisco is extending southward along the bay shore to South San Francisco and a deeper channel along this shore line will shortly be needed.

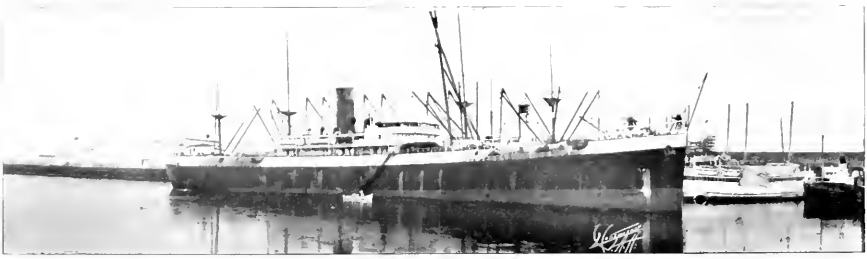
Oakland Commissioners of Public Docks are preparing two plans for harbor improvements which will be submitted to the United States Engineers through Colonel Herbert Deakyne, district representative. The Public Docks Commission of Oakland has requested the United States Engineers for help in the development of this harbor.

The Sunset Lumber Company, has started to rebuild the east side of their wharf.

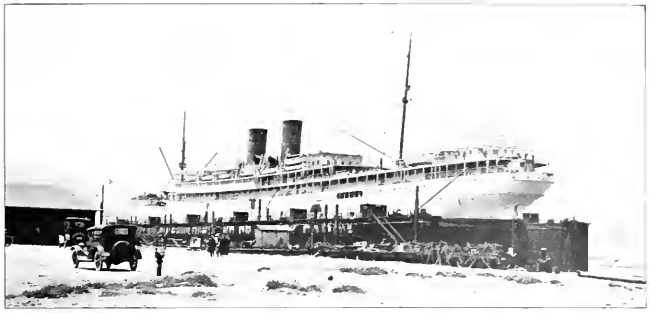
Long Beach. Report was received from Washington that the House Rivers and Harbors Committee reported favorably on the proposed improvement of the Los Angeles and Long Beach harbors, at a total cost of $1,250,000.

Venice. Petition has been made by residents of Venice to the Board of Trustees for the construction of a $300,000 breakwater project in the south beach district.

It is reported that a Japanese company has been negotiating for a site at this port for the establishment of a terminus for a fleet of fishing boats. The name of this company is the Himuro Company.



This is the steamer Jacques Cartier, flagship of the French Line's fleet of cargo steamers in the Pacific Coast-European trade. The Jacques Cartier is the second largest cargo steamer ever placed on this important route. She is now on her third voyage to Pacific Coast ports; she carries 12,000 deadweight tons; includes in her personnel sixty cadets training for officers in France's merchant marine. The General Steamship Corporation are agents for the Pacific Coast. Photograph was taken at San Pedro, California.



The reconditioned Los Angeles Steamship Company's steamer City of Los Angeles on the floating dock of the Los Angeles Shipbuilding & Drydock Corporation for painting and for removal of old propellers and installation of new turbine-type wheels. This is the largest lift ever negotiated by this dock, the steamer displacing a little above 13,000 tons.

The boats operated by the Himuro Company are said to be equipped with apparatus for freezing fish by the salt brine method.

Eureka. The Nelson Steamship Company has purchased the terminal properties of the Pacific Steamship Company at Eureka, consisting of a dock and warehouse.

Los Angeles Harbor. Los Angeles Harbor Commissioners have been giving some consideration to the question of acquiring a complete dredging plant to be owned by the Harbor Board. Engineers of the board have been instructed to prepare data relative to ascertaining the probable cost of a complete dredging plant which will be equal to the demands placed upon it in maintaining required depths in the various channels of the harbor.

The Harbor Commission advertised the first part of June for tenders to supply fire protection equipment to be installed at berths 232-A and B, and berths 230-D and E. Recommendation was made by one engineer for the installation of a sprinkler tank of 75,000 gallons capacity for berths 175 and 176. A similarly constructed tank, but of larger capacity, will be erected at the new Terminal Island transit shed in the letting of a contract which is expected will be accomplished before the end of June.

San Diego. The Navy Department will shortly start building of a navy storehouse, barracks building and concrete roads at San Diego. Five hundred and thirty thousand dollars has been appropriated for this work and the bids will be opened June 18. Specifications are available at the headquarters of the San Diego commandant.

Portland. Shipments of wheat and flour from the northwest to foreign and domestic ports for the 1923-1924 cereal season to May 31 amounted to 65,138,497 bushels, flour being reduced to wheat measure. In wheat alone there had been shipped from Portland and the Columbia River district 25,294,380 bushels, while a year ago the showing was 14,409,925 bushels. The flour movement is given by the Merchants Exchange as 3,355,784 barrels.

The Port of Portland Commission the latter part of May authorized the issuance of $500,000 in bonds with which to complete the construction of a new 30-inch steel pipeline dredge to be equipped with a diesel-electric plant. The issue will be dated July 1.

Dredges Columbia and Tualatin are engaged in dredging a new marine road in the west channel of the Columbia River at Swan Island at Portland, which will afford a more direct course between the St. Johns bridge and the center of the harbor.

Two grain washing machines are being installed on Terminal No. 4. Engineers of the Public Dock Commission have recommended purchase of equipment to facilitate handling lumber at Terminal No. 4, including a 90-foot gantry crane.

Seattle. Silk shipments from Japan continue to be one of the chief importations through the port of Seattle. One vessel alone, the Arabia Maru of the Osaka Shosen Kaisha brought 5550 bales and cases the latter part of May, valued at $11,000,000. The silk required 19 railway cars to transport it east.

The growing importance of Alaska as an industrial territory is shown by the increase in shipping between that territory and Seattle. Shipments from Seattle to Alaskan ports for the first part of 1924 have increased 50 per cent in value as compared with those for the same period in 1923.

Puget Sound Naval Station is issuing specifications for the construction of a radio compass station on Destruction Island off the Washington Coast. The project includes a building, fuel tanks, and masts for radio aerials. The new radio station will be equipped with position-finding apparatus and will be a big advantage to shipping in foggy weather. Bids will be opened at Washington, D. C., July 9.

Another radio compass station will be constructed at Point St. George, California, the bids for which will be opened July 9. The specifications for this work can be found at the office of the commandant of Mare Island. The amount appropriated for this job is $30,000.

A new dock and fitting-out pier will be constructed at the Navy Yard at Bremerton with funds provided by the Naval Bill. The pier will be made the base for equipment for handling heavy weights with greater facility than is provided anywhere in any country, according to Admiral Gregory, chief of the Bureau of Yards and Docks. It will be 1200 feet long and 100 feet wide and equipped with two cranes. The larger one will have a capacity for lifting 350 tons and the smaller one will be a traveling crane of fifty tons capacity. With this outfit it will be possible to lift the largest gun made or any part of the machinery of a war vessel. The largest crane will cost $1,250,000 and the smaller one a lesser sum. The total cost of the dock and outfitting pier will be $1,900,000, of which $250,000 will be available this summer.

Hawaii. Following is a list of the allotments of territorial loan funds for 1924 made during May as the result of recent sale of Hawaiian Territory bonds in New York:

1.	Construction of Pier 11 and dredging (Honolulu)	$350,000
2.	Wharf and dredging, Kewalo Basin	120,000
3.	Concrete slab, rear of Pier 2	30,000
4.	Reconstruction of Kuhio Wharf, in concrete	35,000
6.	Wharf and harbor improvements, including approach, Kahului	105,000
8.	New wharf, dredging and purchase of present approach, Kaunakakai	125,000
9.	Nawiliwili wharf and terminal improvements	45,000

Announcement has been made by the Navy Department that the combined Atlantic and Pacific fleets will be assembled in Hawaiian waters next January and will remain until June 30. From Hawaii a battlefleet may be sent to Australia, although this has not yet been definitely decided upon. Tentative plans for the naval maneuvers next year include the most extensive and comprehensive operations of the kind ever attempted by the American fleet.

The Navy Department will spend $100,000 for the building of a storehouse and case ammunition filling house at Pearl Harbor. The specifications for this work can be obtained of the commandant at Mare Island, California, and the bids will be opened in Washington July 13.

Libby, McNeil & Libby will construct a wharf at Kola, Molokai.

Hongkong, China. The Hongkong & Whampoa Dock Company, Limited, is completing arrangements for the construction of a new graving dock near the present docks of the company, which will be known as No. 4 dock. The principal dimensions of the proposed dock are:

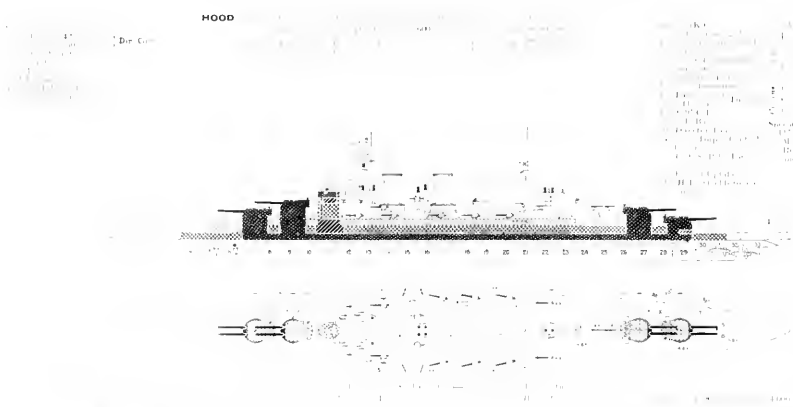
Length from floorhead to inside of caisson	1200 ft. 0 in.
Length of inner portion from inside of caisson	710 ft. 0 in.
Length of outer portion from inside of caisson	470 ft. 0 in.
Breadth of entrance at coping	120 ft. 0 in.
Depth of water over sill (O. H. W.), ordinary spring tides	45 ft. 6 in.
Depth of water over sill at mean sea level (i. e., 4 feet above Admiralty datum)	37 ft. 6 in.

H M S. HOOD

This vessel, the largest and most heavily powered ship of war in the world, visited San Francisco for four days early in July. The editor of Pacific Marine Review had the privilege of inspecting her engine and fire rooms and wishes here to express appreciation of the courtesies extended by the officers of the ship and by the British Consul.

Below we reproduce a diagrammatic arrangement and general characteristics of the vessel largely taken from "Jane's Fighting Ships."

THE WORLD'S LARGEST BATTLE CRUISER



Diagrammatic view, profile and deck plan of H. M. S. battle cruiser Hood from "Jane's Fighting Ships".

The Hood was originally designed in 1915 with 36,300 tons displacement, 25½ feet normal draft, a speed of 33 knots, and with much thinner armor and only two torpedo tubes. Subsequent to the battle of Jutland this design was worked over and 5000 tons of additional armor protection was provided. By the use of small tube modified Yarrow boilers, 24,000 shaft horsepower was gained on the same machinery weight. It is interesting in this connection to note the use on these boilers of a large number of low power oil burners of very simple design manufactured by Dewrance of London and to know that under this system no trouble has been experienced with these boilers.

At the trials on a displacement of 42,200 tons and with a developed shaft horsepower of a little over 150,000, the Hood attained a speed of 33.07 knots in bad weather against a head wind on the Arran Mile. On two-fifths power she obtained easily a speed of 25 knots.

The turbines are arranged in three engine rooms, the forward engine room housing the two sets working the outboard screws. For cruising, a small turbine is provided on each of these outboard screws and this turbine works through a clutch, which is disconnected when the main turbines on these two outboard shafts are to be put in operation.

The fire and engine rooms on the Hood are very efficiently ventilated and in the engine room an indirect lighting system is used, giving an effect of brilliant daylight and no shadows.

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

EXTINGUISHING OIL FIRES BY USING LIQUID CARBON DIOXIDE

By WALTER H. FREYGANG, M.E.,
Walter Kidde & Company, Inc.

FIRE aboard ship has always been a grim specter to all seafaring men. The skipper of the old clipper ship extinguished fires by using water which his men had only to pump from the sea. The advent of steam brought the steam pump into use. Then it was found that fire in enclosed spaces, where cargo is stored, could be extinguished by flooding the hold with live steam. The use of steam had certain advantages over water. In general it did less damage, but more important even than this was the fact that it did not disturb the stability of the vessel. With the introduction of internal combustion engines, the use of inert gases for extinguishing fires had to be studied and new developments brought forth.

For some years inert gases have been employed in closed spaces. The gases used have been carbon dioxide, flue gas from the stack, and sulphur dioxide. The use of flue gas has been abandoned on account of the size of the cooling and purifying apparatus and on account of the storage space lost due to the large ducts used to distribute the gas. Sulphur gas is being used to a very limited extent, as it is poisonous and very corrosive. It must be generated on board, and on account of the corrosive nature of the gas it becomes almost necessary to renew the generator each time it is used. This, of course, is very expensive.

Carbon dioxide has been recognized for years as a fire extinguishing agent and many years back Congress enacted legislation permitting the use of carbon dioxide in place of steam on board ships. Carbon dioxide is also the gas generated by chemical reaction in the soda and acid extinguisher, and is the gas in the bubble of the foam extinguishers.

Up to a few years ago the use of pure carbon dioxide was limited by its tendency to freeze when released from the storage cylinders in which it is transported under pressure in its liquified state. The property of freezing hindered the rapid release of gas by the accumulation of solid carbon dioxide in the valve passages. Due to the fact that the boiling off of the liquid requires heat, most of which is taken from the liquid itself, one-third of the stored quantity is frozen to a solid and is not available until thawed out. The thawing operation is difficult, burdensome, and lengthy.

The newer method of release, known as the Lux System, was patented in the United States by a native of Sweden. This system entirely eliminates the uncertainty of discharge and permits the entire contents of the cylinders to be immediately available. The result is accomplished by not permitting the liquefied carbon dioxide to boil until it is discharged from the conveying pipe into the atmosphere. Immediately upon its discharge into the atmosphere the liquid is vaporized and a large percentage is projected as fine particles of solidified carbon dioxide.

To compare the results, a commercial cylinder of carbon dioxide when fully opened to the atmosphere will release two-thirds of its contents of fifty pounds in about eight minutes, the balance remaining in a solid state within the cylinder. The discharge is irregular, depending upon the accumulation and thawing of solidified carbon dioxide in the valve passage. If a Lux cylinder is fully opened to the atmosphere, the entire contents of fifty pounds are discharged in forty seconds.

The urgent need of fire protection no vessels carrying oil in bulk pro-

Diagrammatic plan showing arrangement and location of piping and cylinders for the Lux fire extinguishing system on the diesel-electric tanker J. H. Senior of the Standard Oil Company of New Jersey.

pelled by prime movers not using steam, and the lack of any system for meeting this hazard, suggested the use of carbon dioxide.

In vessels carrying oil, the tanks are usually provided with expansion trunks which allow the expansion and contraction of the oil to alter its level in these trunks without disturbing the stability of the ship. On this type of carrier, fire may occur when the hatch cover is open; or, in case of an explosion, it is sometimes so provided that the hatch cover would be blown off. The fire extinguishing device, therefore, need only be installed so as to extinguish any fire occurring in this trunk. It may also be desirable to have numerous trunks flooded at one time, for if the commodity carried is gasoline, there is no time to operate particular valves. The weight of the equipment, initial cost, and maintenance cost are also of prime importance.

The application of the Lux system to this problem was thought feasible on account of the fact that the gas could be brought on to the surface of the burning oil in large volume and at high velocity. The Lux system of piping liquid carbon dioxide would, for each cubic foot of liquid conveyed, deliver 450 cubic feet of was, this being the approximate ratio of liquid to gas under the usual temperature and pressure conditions.

Gasoline fires do not normally require a very high concentration of carbon dioxide. It is also unnecessary to keep this concentration over the surface for any length of time, as the fire to rekindle requires the presence of a flame. It is necessary, however, to extinguish the fire fully, as the presence of the slightest flame will rekindle the vapor.

Arrangements were made with one of the carbonic manufacturers to conduct tests at their plant on the East River, Long Island City, New York. The preliminary experiments made use of a small tank measuring approximately 1 foot by 4 feet and 1 foot deep. All experiments were conducted out of doors in a very windy location on a bulkhead along the East River.

It was found that projecting the gas through perforations drilled in a straight line along a pipe so that the jets of carbon dioxide were in one plane entrained air in quantity sufficient to fan the fire and increase its intensity rather than extinguish it.

Other tests were made by using two planes taken at random, and it was found that the fire in many instances could be extinguished. Our investigations then led to the adoption of nozzles of proper size, determining the right spacing, and finding the most desirable angles between the planes of discharge.

A new experimental tank was built which was approximately 4 feet long, 1 foot wide and 4 feet deep, the gas being projected across the 4-foot dimension, and a complete study was made. The results obtained indicated that one principal plane of jets for extinguishing the fire was necessary and that sufficient gas had to be projected in another or second place to supply the necessary carbon dioxide concentration in the air entrained by the nozzles in the first plane.

The second plane of projecting jets had to be inclined at an angle depending somewhat on the width of the trunk and the level of the oil below the nozzles. The results were so successful that a larger experimental tank was built, the upper section of which is a duplication of a typical ship's expansion trunk. This tank is shown in the photographs and has a lower dimension of 9 by 9 feet with a height of 4 feet, while the expansion trunk is 5 by 5 feet with a depth of 2 feet.

The principles learned from tests on the earlier tanks were applied in this instance with results that were highly satisfactory. The experiment also showed that the depth of oil in the tank had practically no effect on the results.

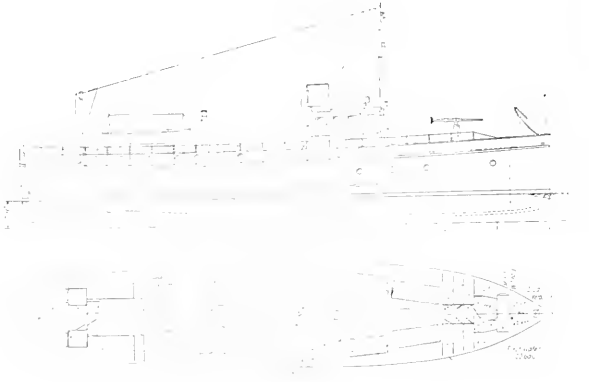
Other development work on a hand extinguisher brought forth a type of knife-edged nozzle, which was found to give better results than a straight-drilled hole.

The straight perforations will freeze up after a short run, while the knife-edged nozzle will not freeze up.

Further development was also necessary in the method of releasing the gas from the storage cylinders, in view of the fact that it was not desirable to have a number of cylinders manifolded together with the vapor pressure constantly exerted on the manifold and its numerous connections. A small leak would dissipate the entire charge. It was, therefore, desirable to have each cylinder containing 50 pounds of carbon dioxide closed off at its valve and be independent of adjacent cylinders.

For the extinguishing of oil fires the time element necessary to open these individual cylinder valves was so great as to make it impractical. The cylinders would often have to be located in an inaccessible place, making it desirable for distant control. A quick release cutter attached to each cylinder, whereby a frangible disc could be cut out by the movement of a lever through an arc, was designed. Any number of cylinders with their cutters could be manifolded and released simultaneously by a distant control.

Development on further uses of carbon dioxide for extinguishing fires is progressing and new and more useful applications will follow. With the methods of quick release now available, endless applications are being suggested. The inertness of the gas, its non-injurious and non-freezing qualities cannot be met by any other fire extinguisher.



Outboard profile and plan of the new Coast Guard cutters for chasing rum runners.

SPEEDWAYS FOR RUM CHASERS

TO power a long line of speed boats, the United States Coast Guard has recently contracted with the Consolidated Shipbuilding Corporation, the designers and builders of Speedway engines, to build a large number of Model MR 180-horsepower Speedway engines.

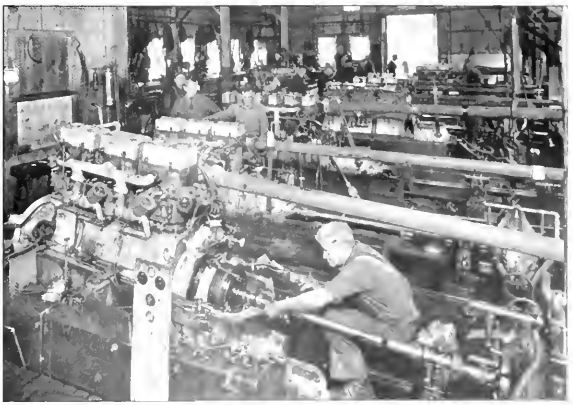
It must be a source of great satisfaction to the Speedway organization for the United States Coast Guard to have selected one of their stock model engines for that branch of governmental service. In an open competition with many other American manufacturers the Consolidated Shipbuilding Corporation offered their regular Model MR engine to fulfill the rigid requirements as formulated by Washington's most prominent marine engine experts. Based upon reliability and sound marine engine design which characterize all Speedway models, the Model MR was chosen above all others. There can be no mistaking the qualities embodied in this particular model which attracted such favor at the Capitol.

Long years of experience in designing and building marine engines allowed the makers of Speedway engines to step forward with a stock model and present it with confidence for acceptance. Indeed, Consolidated in their development of Speedway engines has blazed the trail for better marine engines, and today stands foremost in their production. In recent years Consolidated has averaged one new Speedway model each year; and, as a result, they have given to the yachtsmen of the world the highest development in marine engine design. That the United States Coast Guard endorsed and approved one of their models in its entirety to the extent of purchasing in quantity speaks volumes in itself.

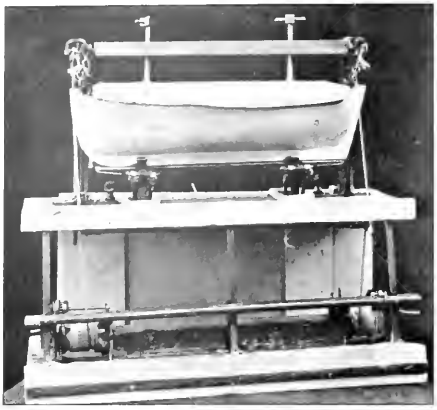
View in the main bay of the erecting shop of the Consolidated Shipbuilding Corporation, showing large number of Speedway engines in process of erection on the floor.

The accompanying photographs will serve in a measure to show the increased activity in the Speedway engine shops at the Consolidated Shipbuilding Corporation's plant, Morris Heights, New York City. No new manufacturing machinery or additional floor space was required to handle the erection of the Model MR in production. The facilities and modern machinery as employed in the daily manufacture of this model were adequate to follow through this large contract award. Forty-one days after Consolidated received the Coast Guard contract, delivery of the first engine was made; since that time engines have been coming through their shops at the rate of one completed engine a day. Not only have engines been delivered to the Coast Guard at this date, but installations have already been made and the engines are in actual service.

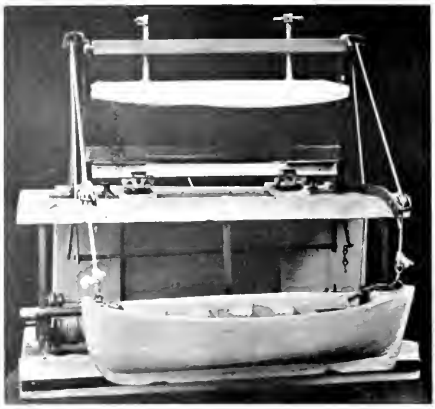
The selection of a Speedway stock model engine adds considerable to the reputation which these engines have enjoyed for a great many years. Hundreds of them have been installed in motor cruisers and yachts throughout the world and their performance has been phenomenal. And, as a crowning achievement, the United States Coast Guard, seeking an engine, sturdy, reliable, turning not over 1300 r. p. m. and adapted for marine use, selected a stock model to power new craft for off-shore service.



Test block at the engine building plant of the Consolidated Shipbuilding Corporation, showing number of Speedway engines on test.



The Mills davit in normal position with boat on chocks.



The Mills davit in operating position with boat hung clear of the rail.

THE MILLS DAVIT

THE illustrations herewith show a working model of a new boat davit invented by Captain Warren H. Mills of San Francisco. Captain Mills is a marine surveyor formerly a sailing ship master of note, and the design of the new davit is the result of long years of study of the boat launching problem.

This problem is to get the boat into the water quickly and yet to have the movement of the boat under perfect control at all times. Captain Mills has succeeded in these two particulars and has added to his design features which give maximum assurance that the boat will be always in fit condition for launching and for taking care of the precious lives that may be intrusted to it.

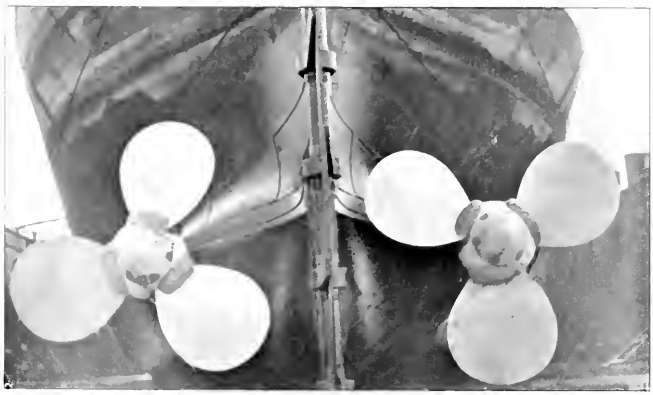
In the Mills davit, the boat is rigidly supported by a hinged platform on which the keel of the boat rests. At each end of this platform and separate from it a rigid post is fastened to the deck, and these posts are connected at the top by a rigid bar. From this bar screws form an adjustable support for a sheet metal cover, which can thus be clamped down on top of the boat excluding all moisture and allowing plugs to be kept tight at all times. This is a very valuable feature.

The davit arms proper in the normal position are housed in the posts. These arms are bell levers and can be arranged to be worked either from the boat deck or the deck below, as shown in the illustration. In the normal position each end of the boat is fastened to its davit arm by a turn buckle and a single flexible wire fall that passes taut over sheaves on the davit arm down to the boat windlasses which are arranged with brakes for one man operation.

The hinged platform is operated by a lever and as this platform is dropped the boat swings out supported by the turn buckles on the davit arms to a point clear of the rail, when the turn buckle loops are automatically released due to the shape of curved hooks at davit arm ends, and the boat is now hanging clear on the falls controlled by one man at the brakes.

The Mills davit then keeps the boat in good condition; launches the boat instantaneously to a position clear of the rail; lowers the boat under perfect control, so that its load can be taken at any level; lowers to the water in a very few seconds.

This davit can be installed for about the same cost as any of the modern davits now in use.



...ned passenger liner City of Los Angeles, showing the new three-ed turbine type propellers installed.

STEAMSHIP NORFOLK EQUIPPED WITH CONTRAPROPELLER

A CONTRAPROPELLER has been attached to the American steamer Norfolk of the Coastwise Transportation Company, to improve her steering and effect fuel economies. This is probably the first installation of this device in an American shipyard. The work was done at the Robins plant of the Todd Shipyards Corporation, and the performance of the Norfolk with her new equipment will be watched with interest by marine engineers.

The contrapropeller is a device consisting of six blades fitted behind the main propeller. The two vertical arms are of cast steel and are electrically welded to the stern frame. The two center pieces, which include the side blades, are made of cast iron and are secured to the vertical arms by bolts and flanges. The side blades being of cast iron prevent the vessel from being crippled by striking a submerged obstacle. In such an event these blades would break off and not bend so as to foul the main wheel.

Several vessels plying in European waters have been fitted with this device and under the most severe ice conditions in the Baltic and along the Norwegian coast the contrapropeller has proved serviceable and free from breakage.

View of stern of the steamship Norfolk on the dock at the Robins Plant, showing contraflow propeller in place as installed by Todd Shipyards Corporation.

Aside from improving the handling of a vessel, the contrapropeller greatly reduces the vibration caused by the main wheel. The revolving propeller of a vessel under way imparts two motions to the water. (1) The axial acceleration which is transmitted to the mass of water in a backward direction by the propeller, on which, in turn, a reaction is obtained, i. e., effective thrust of the propeller. (2) The tangential velocity of the water is due to the fact that the energy required for moving the ship is transferred to the water by the revolving propeller. The road traversed by the water particles has therefore the shape of a screw. The turning impulse contained in the jet behind the propeller is not utilized any further for providing movement to the ship. The energy corresponding to it is therefore wasted.

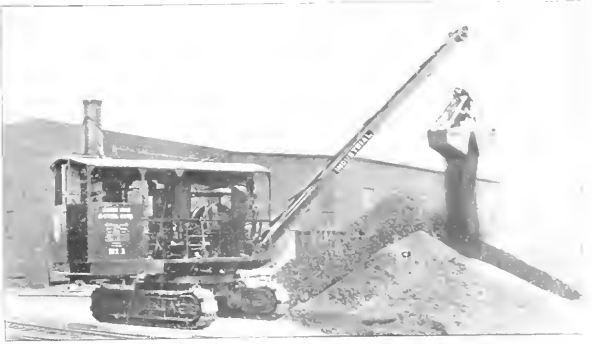
The radical blades of the contrapropeller intercept this turning motion and divert the water into axial acceleration while its absolute speed remains constant. This increased backward thrust is pure gain and serves to increase the speed of the vessel or, inversely, if normal speed is maintained, the fuel consumption is decreased.

A NEW TEN-TON CRAWLING TRACTOR CRANE

THE Industrial Works, Bay City, Michigan, who recently designed and built several 200-ton locomotive cranes which were the largest in the world, now offer a new type at the other end of the scale. This is a 10-ton crawling tractor crane, embodying many new engineering features and known as type "D".

One of the most important features is the independent control of the traveling, slewing, and hoisting motions. These motions may be utilized in a variety of combinations which are said to result in a greatly increased speed and efficiency of operation. For instance, the hoisting and slewing motions may be combined in bucket work for operation at high speed and, when traveling, the boom may be swung in any direction to clear obstructions. Slewing in either direction is accomplished without reversing the engine by means of a double friction clutch and a train of bevel and spur gears. A slewing brake holds the boom securely with a suspended load in any position. When operating on uneven ground, this brake eliminates any possibility of sudden rotation with its usual disastrous results. The vertical slewing shaft is located accessibly at the front of the crane close to the base of the boom, and since the power is transmitted at this point, there is

(Continued on Page 32, Adv. Sec.)



Ten-ton crawling tractor crane at work on dock.

REBUILDING THE R. G. HALFORD

By DAVID W. DICKIE

THE R. G. Halford was built in 1911 by D. V. Hooper at Vallejo, California, for John J. Kennedy and named after her first master, Ralph G. Halford. She was originally laid out to be powered with a 30 horsepower engine. This made the hole in the shaft log very small and the center of the shaft very close to the bottom of the boat. Subsequently the 30 horsepower engine was taken out and a 65 horsepower engine installed. There was insufficient room to get a good foundation under the engine and the original strengthening was cut away to provide room for the new engine. The boat has changed ownership twice and is now owned by the Bay Cities Transportation Company, San Francisco.

The writer was instrumental in persuading the previous owners to change to a diesel engine and to strengthen the boat to take care of the excessive strains set up by the new type of engine, but they were later persuaded that the proposed strengthening was unnecessary and the new diesel engine was installed about September, 1922, with a makeshift attempt to avoid strengthening the boat.

The Bay Cities Transportation Company ran the boat until April, 1924. Eighteen months with three repairs, when they decided that the interruptions to the fine service they were maintaining and the upkeep, repairs were excessive, and commissioned the writer to stop the trouble.

The engine was taken out, entirely taken down, cylinders bored, crankshaft rebedded and generally overhauled.

As had been discovered at the first inspection there was not one floor timber in the boat and such members as the keelsons and fore and aft strengthening in the bottom of the boat were all cut in various places where the flywheel, base pan, etc., extended down and interfered. The boat was then put on Pete Swanson's ways, San Francisco, and the shaft log and deadwood were removed down to the keel. A fresh start was made in rebuilding.

After everything was loosened, the heels of the frames were shored down $6\frac{1}{2}$ inches and the keel lowered to suit. The stern was raised $4\frac{1}{2}$ inches.

A new hardwood sternpost sided 12 inches and molded 14 inches was installed about two feet aft of the old position and the strut abandoned; also a complete new deadwood was installed, sided 8 inches at the keel, 12 inches at the shaft log, and 12 inches above.

New floors sided 10 inches and molded 6 inches were built in from a point forward of the engine along under the engine. Aft of the engine the floors were sided 6 inches and molded 6 inches, worked from along side of the shaft log out to the stern.

The R. G Halford on her trials after rebuilding.

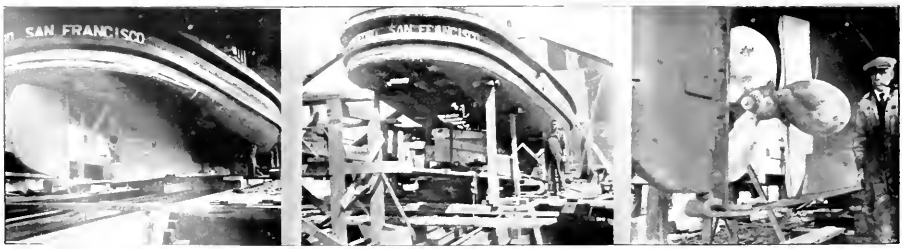
New engine timbers were installed made 12 by 12-inch along under the engine and 6 by 12-inch beyond clear to the stern. In the process the shaft center was raised 8 inches forward at the flywheel and lowered 6 inches at the center of the propeller. The lowering of the heels of the frames provided ample room for the after end of the engine.

The new keelson was made 6 by 12-inch on its flat attached to the deadwood forward and aft. New garboards edge bolted to the keel were installed and other planking restored.

The top of the engine formerly had been braced to the house and the vibration had loosened the fastening of the house and caused the boat to leak generally. Some of the bolts in the old work had eaten away from $\frac{3}{4}$-inch diameter to $\frac{1}{8}$-inch diameter. The bolts were too far apart and the timbers had separated, allowing the salt water and the copper paint to set up galvanic action around the bolts. Two seams were open $\frac{3}{4}$-inch and were filled with oakum.

When the reconstruction was finished the engine was reinstalled and a test made of the vibration before the engine braces were installed. At 206 revolutions per minute the athwartship vibration was 3 16 inch at the top of the cylinders to nothing at the

(Continued on Page 429)



T... ... the R. G Halford during reconstruction, showing changes as explained in the text.

AN HONOR ROLL

ONE of the most important factors in the equipment of a modern power propelled vessel is the engine room staff. All intelligent employers are constantly on the outlook for methods by the use of which better morale may be maintained among engineers. The United States Shipping Board is using an honor roll and bonus system with considerable success.

Reproduced herewith is the Honor Roll of Chief Engineers sailing out of the port of New York for the period ending December 31, 1923, which has just been announced by the Fuel Conservation Committee of the Shipping Board. This honor roll represents those chief engineers of Shipping Board vessels who have made excellent records as regards fuel economy and engineering performance and is one of the steps taken by the Fuel Conservation Section in an endeavor to stimulate interest and competition among the various vessels.

The Emergency Fleet Corporation has just authorized the payment of a bonus of $50 each to every man whose name appears on honor rolls commencing with that for the period ending December 31, 1924. In this way the Fuel Conservation Committee hopes to still further stimulate interest and competition among the engineers in maintaining their department of the vessels in a high state of efficiency.

CHIEF ENGINEER	VESSEL	MASTER	OPERATOR
THOMPSON T.	"ARCHER"	HANSEN R.E.	PACIFIC STEAMSHIP LINES
EDES EVERETT N.	"WILLIAM PENN"	WRIGHT M.H.	" " "
BERNSON E.J. @	"ECLIPSE"	SMITH O.A.	" " "
BJORN GEO. @	"ELKTON"	DORNING A.A.	" " "
MURRAY E.M.	"SCOTSBURG"	NICHOLSON J.F.	" " "
AUGUSTINE L.	"STANLEY"	HUNTLEY W.E.	" " "
ADAMS C.S. @	"WEST CHERON"	FOYE M.M.	BLACK DIAMOND S.S. CO.
PIFFIN D.J.	"WEST INSKIP"	TURNER L.J.	" " " "
FLETCHER R.A.	"HYOKO"	LAWS W.	" " "
ANDERSON J. @	"ALA"	SHEVLIN E.P.	" " "
STEWART P.S. @	"ANACONDA"	JONES T.S.	" " "
WOODCOCK W.F. @	"WESTBERN"	HUMPHREY J.F.	" " "
TRENT THOS.	"CONCORD"	FALSEN S.	A. H. TULL & CO.
GRAY WM.F. @	"SANGAMON"	EAGLES J.C.	" "
DENISON L.H.	"WEST KEOPEN"	CLARK E.E.	" "
PARCOTT ARTHUR @	"SAGUENAY"	MILLS FRANK	COSMOPOLITAN SHIPPING CORP.
ADAMS F.A. @	"PIPESTONE COUNTY"	STOCKBOE J.T.	" " "
CRISP G.H. @	"MCKEESPORT"	SANDERS H.E.	" " "
RICE F.E. @	"MCKEESPORT"	SANDERS H.E.	" " "
HALL J.W. @	"MCKEESPORT"	SANDERS H.E.	" " "
THORSBY W.S. @	"VINCENT"	SMART ALEX	" " "
CLARK J.H. @	"EGLANTINE"	HOLMS W.E.	" " "
FENWICK F. @	"SAROKAIE"	CHRISTIE M.T.	" " "
LOYD S.W.	"VIRGINIA"	LARSEN E.J.	EXPORT STEAMSHIP CORP.
WOODSON C.	"DOCHET"	CHURCHILL C.R.	" " "
ILLHARDT A. @	"ARGON"	CLARIDGE H.J.	" " "
TOPPING P.L. @	"LIBERTY GLO"	MITCHELL J.R.	INTERNATIONAL FRTG. CORP.
RICE CLAY @	"CASPER"	WATKINS L.	" " "
BLANCHARD A.H. @	"HALEAKALA"	PRATT J.M.	" " "
EHRMANN F.W.	"ASCUTNEY"	GORMAN I.F.	KERR S.S. CORP.
PEST B.	"WEST HAMMER"	WILDE W.	" "
TUPPY B.E.	"WILEY"	ADAMS W.N.	" "
HODGES J.E. @	"WEST CALLOP"	FORBES P.W.	" "
HODGES J.E. @	"WEST CANON	LYONS F.V.	" "
PARKER J.A. @	"EASTERN GLASS"	THOMPSEN A.L.	WALLACE TRANSPORT LINES,
URVIN S.L.	"PHEATON"	SALISBURY J.E.	WITTNACHT, A. E.
AULD J.T.	"RESPONSET"	ROBERTS J.E.	"
LEAN E.O. @	"KENMORE"	MOON P.D.	MOORE & MCCORMACK
CARTER T.H. @	"NATHAN"	FOSTER L.W.	" "
STRUBING H.E. @	"PAN AMERICA"	ROSE C.O.	MUNSON STEAMSHIP LINES
RICHARDSON J.L. @	"PAN AMERICA"	ROSE C.O.	" " "
THOMSON J.W. @	"WESTERN OCEAN"	PORTER L.M.	" " "
SCHRING H.E. @	"SOUTHERN CROSS"	FELS J.C.	" " "
STUART R.M.	"SOUTHERN CROSS"	FELS J.C.	" " "
FLEMING A.C.	"AMERICAN LEGION"	SHERIDAN C.F.	" " "
ELLIOT E.M.	"PIERCE"	STEVENS F.	" " "
ERSKINE J.	"WEST COHEM"	WILLADSON K.C.	MUNSON STEAMSHIP LINES
GILKEY W.F.	"ARTYAS"	CLARK W.H.	NORTH ATL. & WESTERN CO.
MILLER S.C.	"ELKTON"	DORLING W.H.	" " "
YANDELL F.C.	"PRESIDENT ADAMS"	FITTMAN M.L.	
ANDERSON C.R. @	"PRESIDENT GARFIELD"	LOCK H.L.	UNITED STATES LINES
		LOCK N.L.	" " "
TURNER J. @	"PRESIDENT GARFIELD"	LOCK H.L.	" " "
		MOORE A.M.	" " "
GORDON J.W.	"PRESIDENT MONROE"	FENDLEBURY J.	" " "
GRATRIDGE W.O.	"PRESIDENT POLK"	MCLEAN T.L.	" " "
GYTRON A.W. @	"PRESIDENT VAN BUREN"	SCHUYLER CUMMINGS	" " "
DESMOND J.J	"PRESIDENT VAN BUREN"	" "	" " "
PARROW J.W.@	"PRESIDENT HARDING"	GRENING P.C.	" " "
ANDERSON C.R. @	"PRESIDENT HARDING"	" "	" " "
FOWLING E.E.@	"PRESIDENT ROOSEVELT	FRIED GEO.	" " "
BARROW J.W. @	"PRESIDENT ARTHUR"	MOORE A.M.	" " "
HARRINGTON G.E. @	"PRESIDENT ARTHUR"	" "	" " "
KINNEBY H.A.	"PRESIDENT ARTHUR"	" "	" " "
COOK C.	"PRESIDENT FILLMORE"	RANDALL A.S.	" " "
BARROW J.W.@	"AMERICA"	BUNDY M.	" " "
FREEMAN F.	"AMERICA"	BUNDY M.	" " "
FOURGEOIS W.@	"GEORGE WASHINGTON"	CUNNINGHAM H.A.	" " "
HOLDEN W.J.	"SANTA MARIA"	LEWIS H.	UNITED STATES & AUSTRALIA
BRIDGES WM.	"EASTERNER"	O'BRIEN R.C.	" " "
MILSOM A.	"EASTERN PLANET"	ROSS R.	" " "
WINTAR T.@	"EASTERN MOON"	ANDERSON J.W.	" " "
HAGH PETER	"EASTERN SEA"	SWENSON H.A.	" " "
RICHARDS F.	"EASTERN STAR"	SELLEY F.H.	" " "
LESLIE W.@	"EASTERN LEADER"	PEMBROKE M.A.	J.H. WINCHESTER & CO.
SKELTON H.F.	"EASTERN FIELD"	PEMBROKE C.F.	" " "
JACKSON A.W. @	"EASTERN GUIDE"	JURRAPS M.A.	" " "

REBUILDING THE R. G. HALFORD

(Continued from Page 428)

engine timbers and the line of vibration was at an angle of 12 degrees from the horizontal. At 256 revolutions per minute the vibrations entirely disappeared, and at 292 revolutions per minute the vibration was 3/32 inch, exactly vertical.

The braces from the top of the engine to the header at the edge of the deck were then installed and the vibration was eliminated entirely until 321 revolutions were reached, when it was 1/32 inch vertically at the point of firing 10 per cent before center. The motion was in a vertical plant at an angle of 45 degrees, the lower end of the line being forward and the upper end of the line aft.

As the engine is rated to run at 300 revolutions per minute the vibration has been practically eliminated at all speeds within which the engine should be operated.

At the trial trip May 23, 1924, the boat was run on the Mail Dock Mile, making a speed of 10.435 miles an hour. The propeller is 47½ inches diameter, 44.66 inches pitch and 42.05 per cent surface ratio, and at 320 revolutions per minute absorbed 91.4 horsepower.

The photographs show the stern of the vessel before was started, during construction, and on the trial trip when finished.

MOTOR TUG FOR NEW YORK HARBOR

THE Ingersoll-Rand Company, New York, is building a directly reversible marine oil engine for a tugboat to be owned and operated by the Grace Lines. This engine is a 320 horsepower 6 cylinder 13 inch bore by 19 inch stroke, and operates at 250 revolutions a minute.

Outstanding features of the engine include: direct injection of fuel oil, single lever control, and low head room, all features which are essential to a tugboat oil engine installation.

The builder of this tug is the Spedden Shipbuilding Company, Baltimore, and it is understood that the boat will be in service by the early fall. It will be operated by the Grace Lines for shifting lighters in New York Harbor and its headquarters will be the Grace Lines pier in Brooklyn.

The engine used in this tugboat is similar to the engines furnished the Diamond "P" Transportation Company for the tugboats Hustler and Sonnitep, both of which are in service.

NEW DREDGING EQUIPMENT FOR CANAL

AN electrically driven floating relay booster plant, designed for use in connection with pipe-line suction dredges for lifting spoil to higher levels or depositing at greater distances than is possible with the dredge alone, was placed in service in Gaillard Cut on March 31, 1924, and has been in use since that date. This plant consists of two 20-inch centrifugal pumps, one of 750 and the other of 550 horsepower, installed in the hull of the old sand and rock barge No. 3. The pumps are so arranged that one discharges into the suction of the other, thus obtaining the properties of a 2-stage pump, or the second may be by-passed when desired for use on shorter or less elevated pipe lines. The plant is portable, contains necessary auxiliary pumps for water service, transformers for stepping down transmission line potential of 11,000 volts to 2200 volts for operating and may be used at any point where 3-phase power at 11,000 or 2200 volts is available.

Connection between the dredge and relay pump is effected by means of pontoon pipe and a pontoon of special design is provided adjoining the intake of the first pump, by means of which, through the agency of two 20-inch flap valves installed in a submerged side outlet, and which are normally closed, the first relay pump will automatically take water whenever for any reason the dredge fails to supply material under pressure. This feature is particularly desirable for preventing pipeline plugs as the line may be cleared with water even though the dredge shuts down without notice.

The plant was in successful operation throughout the month of April, 1924, part of the month relaying material a distance of 9739 feet and over a maximum elevation of 61 feet. The total length of line from dredge to outfall was 10,761 feet or over 2 miles. The indications are that the plant can be expected to handle material efficiently to elevations of over 250 feet through short lines (under 1500 feet), or through a total pipe-line length of about 3 miles for low lifts (under 20 feet).

The cost of handling Cut maintenance material with this plant is less than 50 per cent of the cost of handling the same class of material with dipper dredges. Delays to operation chargeable to the relay barge in April were only 24 per cent of the total delays to the entire plant. —(Panama Canal Record.)

The Johnson Water Bug

THERE has been constant improvement in outboard motor design for small boats. One of the latest products in this line is known as the Johnson Water-Bug.

This unit is driven by the Johnson Twin gasoline motor. The entire arrangement weighs only 35 pounds. The motor has two cylinders, with a piston displacement of 9.42 inches, and develops two horsepower. It is completely enclosed, dust and grease proof, and embodies some very unique features. It is claimed to be the lightest outboard motor in the world. Steering and reversing and maneuvering of all sorts are accomplished simply by swinging the motor to any angle so that the operator can get instant reverse or can drive complete circle at will.

The cylinders are directly opposite to each other and both fire at the time time, so that the engine runs free from vibration and with a minimum of noise. Starting is accomplished on the high tension magneto through the spinning of the motor, about the same way one would spin a top. A quick action, high speed magneto is built into the fly-wheel. The motor and the propeller shaft mounting unit can be taken apart as easily at one joint as the taking down of a shot gun, and can be packed in a handy steel case and put under the seat of a pullman car or strapped on the running board of an automobile.

Lubrication is entirely automatic; there are no oil holes or grease cups. On striking an obstacle while the boat is being driven forward or reversed, the propeller shaft unit automatically tilts so as to pass over any object which will be cleared by the bottom of the boat.

The Johnson Water-Bug can be fitted to any style of boat stern or to any standard canoe.

A. G. Hebgen & Company of San Francisco are California distributors for the Johnson Water Bug and also for a good line of canoes and pleasure craft.

BURNWELL SYSTEM.

Our illustration shows the steamer Shreveport, a 10,000-ton oil tanker. The John S. Fatten Engineering Company, Inc., of New York, recently installed a natural draft Burnwell fuel oil system on this vessel, replacing a forced draft installation. This change reduced the fuel consumption from 227 to 180 barrels a day, and the vessel is now running on an 85½ per cent boiler efficiency, which the owners consider an excellent showing.

Pacific Marine Review

LUBRICATION ON SHIPBOARD

An Open Forum—Questions on Lubrication Problems are Invited; They will be Answered in Order of Receipt

INSTALLMENT No. 2

Question No. 9.—Will you discuss the lubrication of marine diesel engines?

Answer.—The subject of lubrication for marine diesel engines opens up a large field for discussion. In this month's article we will attempt to touch it only in a general way and from time to time will go into the mechanical construction and design, which largely determine the grade of the product and its application.

The advent of the internal combustion engine has brought about great changes in hydrocarbon lubricants and, in a general way, an oil for efficient cylinder lubrication of the present day full diesel engine must possess:

1. Viscosity at operating temperature which will insure an oil film between the cylinder walls and piston to form a good piston seal;

2. Flash test high enough to stand cylinder wall temperatures;

3. Cold test low enough so as not to congeal at any atmospheric temperature encountered in operation;

4. Emulsification test that shows complete separation from fresh or salt water as laid down by the United States government in its Class "C" specifications for diesel engine oils.*

5. Color: Perfectly light color as the pale colored cylinder lubricating oils are non-carbonizing and have been proved by government tests as the best lubrication for internal combustion cylinders.

Cylinders are generally provided with positive feed mechanical oilers. A hand pump to prime the oil pipes in starting up is of great advantage, and at times when an extreme amount is wanted, it can be instantly supplied.

In regard to bearing lubrication and air compressor lubrication, it is generally good practice to use the same oil as is employed for the cylinders. This does away with the danger of mistakes and reduces the number of brands of oil to carry aboard.

The viscosity of oil for bearing use should not be too high, as in the circulating force feed type the oil acts as a cooling agent and carries the heat away to the cooler, but if too heavy this purpose in impaired or even defeated.

Various types of lubricating systems are in use, but the circulating type equipped with oil coolers is now well established and its many advantages are fully appreciated by both builders and operators.

The oil in the above system is forced under pressure from a geared pump or a plunger pump to the main bearings and to the crank pins and wrist pins through holes drilled in the crank shaft and connecting rods. A positive feed is thus assured and the only point to remember is that all bearing clearances must be kept uniform because slack bearings will rob the other bearings of their supply.

Valve stems should be lubricated with kerosene or cylinder oil cut back with kerosene to prevent gumming on the stems. The valve gear, reverse gear, and various small parts are hand oiled or have sight feed lubricators and in some places grease cups are installed. The sump in the crank case should be provided with a double strainer or pump suction and this should be changed every watch so that the one in use on previous watch can be thoroughly cleaned. This may not be necessary, but is good insurance that your pump suction will not be stopped up.

Gauze strainers or a filter should be installed between the pump or gravity tank and the bearings. With these precautions and a good clean system, lubrication troubles should be eliminated.

Care should be exercised in bunkering up lubricating oil so that no water or foreign matter enters the fill pipes. A good funnel provided with a gauze screen and the funnel screwed into the deck fill lines will save a lot of trouble.

Drain out impurities from time to time at the drain cocks provided for that purpose and be sure in your oil cooler to carry the oil pressure higher than the circulating water pressure, which will prevent contamination of the lubricating oil by sea water.

Carbon deposits are nearly always charged to lubricating oil, but the fuel is a great and frequent cause of such condition. Fuel oil containing too much free carbon and ash when not consumed by combustion will deposit impurities and when combined with a lubricating oil and baked by cylinder temperatures form a troublesome deposit, which in the course of time will build up and become incandescent and ignite the incoming charge, causing knocking and strain on all parts.

A QUESTIONNAIRE

This new department of Pacific Marine Review is now called upon to discuss the lubrication of the diesel engine from the practical operating standpoint.

In the preparation of our notes we are glad to inform our readers that we have received assistance from consulting engineers, practical operating engineers, diesel engine manufacturers, and lubricating oil specialists.

We especially acknowledge the cooperation of the Associated Oil Company staff of lubrication and consulting engineers in the compiling of data.

Question No. 10.—What are the advantages incident to the use of the lubricating oil purifier in connection with a marine diesel installation?

Answer.—The oil purifier of the centrifugal type or the regulation filter is of great advantage aboard ship. With it your used oil can be reclaimed and used over again for all bearings and general lubrication. It is not considered good practice to use reclaimed oil in your mechanical feed for cylinder lubrication. Any well known centrifugal type will quickly and easily separate water and dirt and deliver the oil back as a first class lubricant. Any oil after being subjected to heat will darken in color by oxidation, but this does not impair its lubricating value for bearings. Would consider the installation of an oil purifier as a very valuable and necessary auxiliary.

Question No. 11.—What is the function of an oil cooler in connection with a marine diesel installation?

Answer.—The oil after being supplied to the bearings and being splashed around in the crank case picks up considerable heat. By drawing this hot oil out of the crank case sump and passing same through the oil cooler consisting of copper tubes, through which is circulated sea water, the oil is cooled back to about 90 or 100 degrees Fahrenheit, depending upon the temperature of the circulating water. This cool oil is then returned to the bearings. The alternate heating and cooling and rapid circulation together with its contact with air causes more or less oxidization, depending upon the character of the oil in use. This will account for its change in color.

If water enters the oil supply, it causes emulsification, and the oil becomes a dirty brown or yellow, and is full of bubbles and foam. Emulsification of your supply is very aggravating and dangerous and great care must be exercised in avoiding it. By keeping your oil pressure in the cooler higher than the circulating water pressure, you can keep the

(Continued on Page 81, Advertising Section)

* United States government specifications covering lubricating oils, as contained in Technical Paper No. 323A, Bureau of Mines, which may be obtained upon request.

FULL AND BY

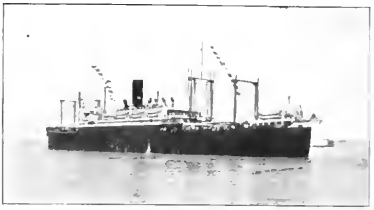
THE CLIPPER SHIP ROSS SHIRE.

The British ship Ross Shire, under command of Captain Andrew Baxter, was a frequent visitor at the port of San Francisco in her run from Sydney to the United Kingdom.

This spirited penciled drawing was made by the captain one afternoon at sea.

WORLD SHIPBUILDING

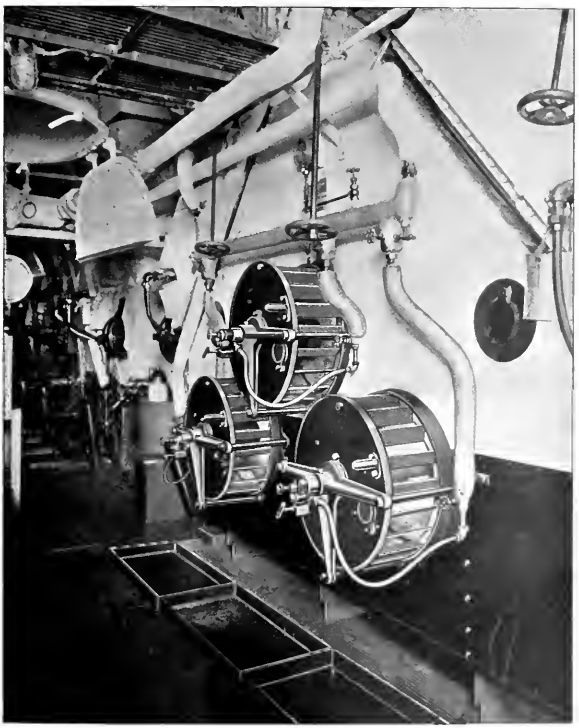
THE United States is one of the very few maritime countries that show no increase in the volume of shipbuilding orders held, as compared with three months ago, says a statement just issued by Lloyd's Register of Shipping, covering the world returns for the quarter ended June 30, 1924. As a result, the statement adds, this country now ranks fifth among shipbuilding nations, not merely Great Britain and Ireland, but France, Germany, and Italy constructing more tonnage than the United States, and Holland producing almost as much. German yards have under way about three and one-half times the amount of tonnage being constructed here. A year ago American shipyards ranked sixth, and three months ago, fourth.



A NOTABLE RECORD

The Pacific Mail steamer President Taft. As reconditioned and with Coen burners installed, the President Taft on her present voyage made Honolulu from San Francisco with 3272 barrels of oil. Her former consumption has averaged about 5000 barrels for this run.

World shipbuilding in the aggregate shows a gain of 100,000 tons over the total at March 31 last. The share of Great Britain and Ireland in this increase is 43,000 gross tons, as compared with a loss of 16,000 tons for the United States, and a gain of 73,000 tons for all other countries combined.



View in one of the fire rooms of the S.S. President Taft showing arrangement of Coen burners and piping on the furnace fronts. This installation was of prime importance in effecting a 30 per cent reduction in fuel consumption..

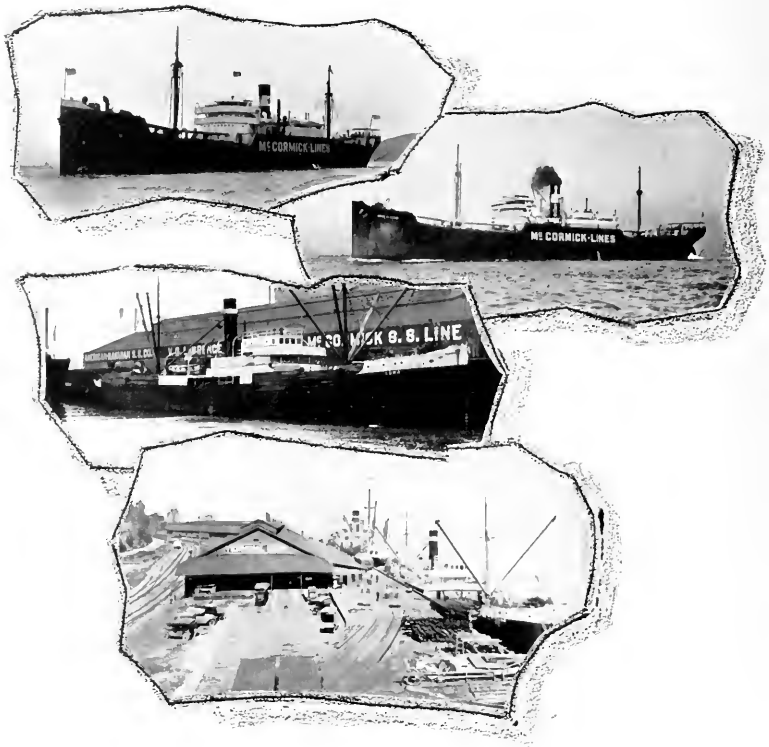
If consideration is given, however, only to contracts on which work is actually being carried on, Lloyd's Register points out, the gain over three months ago is slightly more than 125,000 gross tons. Suspensions on work in Great Britain and Ireland now represent only 52,000 tons, as against 101,000 tons in the previous quarter. For the other countries combined, however, the latest total is 140,000 tons, compared with 118,000 tons at March 31.

Returns for the quarter just ended, showing the construction work being done in all countries under Lloyd's Register supervision and intended to be classed with that society, show a total of 1,641,246 gross tons, as compared with 1,517,859 tons on March 31 and 1,360,067 tons on December 31. Of the present total, 1,210,231 tons are being constructed in Great Britain and Ireland, as against 1,152,000 in the quarter previous, and 1,085,362 tons at the beginning of this year. Thus Lloyd's is at present classifying 62 per cent of all shipping building in the world, and almost 80 per cent of all under construction in Great Britain and Ireland.

There are a number of encouraging features in the present returns. New orders placed are more than keeping pace with the output as shown by the comparative figures of volumes of launchings and new work started during the past quarter.

The steady growth of the motorship in favor is shown by Lloyd's returns. On June 30 there were being built throughout the world more than 800,000 tons of this type of vessel, as compared with less than 700,000 tons on March 31. While at the end of March Great Britain and Ireland were constructing only 44,000 tons less of motor shipping than the shipyards of all other nations put together, on June 30 these other countries had increased their lead to practically 100,000 tons. Motor-

(Continued on Page 439)



PACIFIC COAST LUMBER FOR THE WORLD'S MARKETS

In this interesting group is pictured a portion of activity on the part of the McCormick Steamship Lines.

Port and starboard, uppermost, are the general cargo intercoastal freighters Charles R. McCormick and Sidney M. Hauptman. Centrally shown is the Edna, combination general cargo and lumber carrier of the McCormick coastwise service at the Lawrence Terminal, Oakland, California. The lower view is the Tacoma Terminal Dock, with McCormick lumber steamer in the foreground receiving from that important yard.

MARINE INSURANCE

DEVELOPMENTS OF THE MONTH

By CHARLES F. HOWELL, Contributing Editor

AT last there is action based on the personal narrative and descriptions of Forrest E. Single of Bigham, Englar & Jones, admiralty lawyers, who went to Japan on a special claims mission for the American marine underwriters and who has only been back a few weeks. It has been impossible for Mr. Single to make a public statement as to conditions resultant from the earthquake and fire of last September, because his first obligation was, of course, to the underwriters who sent him to Tokio and Yokohama. Even so, there has been so much delay in taking action upon the information he brought back, chiefly because of the involved and important legal features of the situation, that perhaps a belated admission of the public behind the scenes will be the more interesting.

Acting upon Mr. Single's report, the New York marine insurance market has decided to extend the time limit on policies covering shipments to Japanese ports. Instead of granting coverage for ten days after receipt at the customs office and for not over fifteen days after discharge from an ocean steamer, the limits have been extended to fifteen and twenty days respectively. Only upon payment of an extra premium can protetcion be secured beyond the twenty days.

Mr. Single announces that port congestion and other hazards arising out of the earthquake have so greatly improved during the last two or three months that the first restrictions imposed by marine underwriters are excessively severe. It has also to be remembered that it takes from fifteen to twenty days to bring shipments through the customs and other points of delay after they have been discharged from the ocean steamer, and therefore the new time limits will be more satisfactory to shippers and consignees than those formerly prevailing.

Obligation of Reinsurers

A striking example of decency and good faith as between reinsurers and direct writers has been creating considerable excitement and discussion in the London market of late. It developed out of the suit brought by the Scottish Metropolitan Insurance Company against A. W. Groom and certain underwriters of his group at Lloyd's for the recovery of their proportion of the costs expended by the plaintiff in defending a claim pressed by the owners of the Greek steamer Katina. This latter claim failed when it was proved that the steamer had been scuttled. The owners of the Katina could not pay the costs of the trial, and the Scottish Metropolitan, feeling they should not be held solely liable for the £5000 of costs in view of the fact that they had thus saved their reinsurers from a heavy claim, sought to recover the costs from the latter. Some of them paid, but Mr. Groom and his associates declined on the ground that as they had reinsured the risk for total loss only they were not responsible under the policy. The case was tried in the King's Bench division before the celebrated Justice Bailhache. It is the custom in practice for reinsurers to stand good in such a case. Justice Bailhache found for the defendants on the ground that there was nothing in the policy to hold them to such an expenditure; but he did so with reluctance and went so far as to observe that he was sorry he could not give a judgment for the plaintiffs in view of the way they obviously profited by the defense of the insurance company.

A poster used in Bethlehem shipyards with good results, and a graph showing the benefits of eight years' drive to decrease lost time accidents.

It is believed that the justice had to decide as he did, under the law, but that the result may very well prove disastrous to reinsurers in that the direct writers may now feel it more to their advantage to effect a compromise and then recover reinsurers when similar cases arise in the future.

In discussing this question Fairplay makes out a strong case for the direct writers, thus:

> The question ought not to have arisen. The principle of good faith is even more necessary in the relations of original underwriters and their reinsurers than between underwriters and original assured, but if the original, before declining to refuse a claim, are led to review the position from the point of view that they may only be pulling the chestnuts out of the fire for the benefit of some other party, the application of the principle is almost certain to be relaxed. In the ordinary way, reinsuring underwriters are only too pleased to back up their original un-

derwriters in such cases. Any unprofitable advertisement which may result from the action does not affect them, and the only question from their point of view is whether the expenses are justified by the probabilities of success, and, when they are consulted before the action is allowed to commence, they are usually willing to agree to share the expenses. As a general proposition, however, it can be safely stated that the ramifications of reinsurance are such that it is practically impossible for underwriters to consult their reinsurers in all but very special cases. Many of the reinsuring underwriters are reinsured themselves and so on, and, because of this, the market generally has confidence in the judgment of the underwriter, who has to deal with the claim in the first instance.

Would Better English Brokerage

Application has been made by the Corporation of Insurance Brokers of London for a Royal charter, the idea being thereby to make the business a close profession in England and one of higher standards than at present. To the great surprise and delight of the advocates of the proposal, the committee of Lloyd's has approved it and has signed the petition. The result of the issuance of such a charter, in the opinion of the great majority, will be to place the business of insurance brokerage upon a higher plane. A number of Lloyd's brokers are already members of the Corporation of Insurance Brokers, but the majority are not. Among the advantages urged in support of the petition is that of the elimination of "single risk brokers"; as also the introduction of an educational system with regular yearly examinations.

Writing Tea

It is interesting to note that in the importation of tea to this country in many claims presented to the underwriters the cause of damage is not a peril insured against, by a strict interpretation of the policy. All shipments of tea are subject to the hazards of a long sea voyage, the principal markets being Ceylon, Java and China. It is packed in very thin cases, the stowage of which is an art of itself. Care has to be exercised in preparing the hold of the vessel for the reception of the tea, especially as regards cleanliness and ventilation.

Very frequently tea is turned out musty, in which event the underwriter is certain to turn to the memorandum clause of his policy, where the following appears:

> Warranted by the assured free from damage or injury from dampness, change of flavor, or decay, or from being spotted, discolored or moldy, unless caused by actual contact of sea water with the articles damaged, occasioned by sea perils.

Should it be found that the must was caused by sea water the insurer generally pays the claim without further question, sea water being regarded as prima facie evidence of sea perils. But the underwriter is quite justified in insisting upon actual proofs of such sea peril.

The exceptive warranty above mentioned should also release the insurer from liability when the tea has been damaged by the absorption of the odors of other cargo. This is why shippers often insist that no other cargo be stowed near the tea. The insurance is usually written free of particular average under three per cent each package. The rates in the trade do not vary to any great extent. Fifty-five cents is generally quoted as the Colombo rate.

English Rates and Values

There is much the same sort of complaint about marine insurance in Great Britain as in this country. The facilities of the market exceed the demand made by the contracted condition of shipping; competition has grown abnormally keen in consequence; rates are being pounded down to almost nothing; and values are steadily slumping.

The annual reports of the insurance companies are now making their appearance right along, for this is the British open season for board meetings and post mortems over the recent past. It is evident that the marine accounts are giving the managers the major part of their anxieties. The more conservative are even inclined to find ground for rejoicing in reduced premium incomes, considering the rates. The severe competition is charged to the overcrowding of the market during the war period. A. K. Barnes, chairman of the Liverpool & London & Globe, has this to say:

> These circumstances, while rendering the problem of maintaining our premium income a difficult one, will inevitably, in the course of time, drive the less stable of our competitors out of the market, and, given a gradual improvement in international trade, we may expect at some future period to revert to normal conditions.

Many old accounts have been allowed by several dependable companies to pass from their books through an unwillingness to write certain classes of risks on the terms now current in the market. Sir Gerald N. Ryan, chairman of the Phoenix Assurance, observes that "in no department of our affairs are patience and steadiness more necessary than in marine insurance under present-day conditions. We are passing through one of those anxious and troublesome periods which visit marine business at intervals and from which recovery is sure to come sooner or later."

Ware the "Innocent Mortgagee"

It will be recalled that the decision of the House of Lords in the celebrated Grigorios scuttling case left much to be desired, from the viewpoint of the underwriters. In order to protect themselves in the future an agreement has been adopted by the Institute of London Underwriters not to insert in policies

of insurance any clause placing a mortgagee in a better position than that of the shipowner himself. The argument is that any mortgagee, in lending money to a shipowner, has at his command the machinery and information for discovering whether the person to whom he lends money is of good repute, and that his losses, should the investment prove unsatisfactory and the mortgagor dishonest, are purely of a financial character and do not come within the scope of marine insurance companies' operations. The agreement reads:

> We hereby agree that as from the present date we will not agree to any clause being inserted in policies of marine insurance issued by us whereby mortgagees are in case of loss by the wrongful act or misconduct of the shipowner placed in a better position than the shipowner would be if claiming on the policy.

New English Adjusters' Rules

The following probationary rule of practice was adopted at a recent meeting of the English Association of Average Adjusters:

> That in practice, where the cost of fire insurance has been reasonably incurred by the shipowner or his agents on cargo discharged under average, such cost shall be treated as part of the cost of stowage.

It is further interesting to note that the association has given definite approval to the probationary rule of practice "that unless otherwise expressly provided the interest accrued on deposits on account of salvage and or general average and or particular and/or other charges, or on the balance of such deposits after payment on account, if any have been made, shall be credited to the depositor or those to whom his rights in respect of the deposits have been transferred."

Proctor's Important Promotion

A well-earned advancement to a highly important field of activity has come to E. B. Proctor, the popular and able manager of the Cotton Tracing & Inspection Bureau. He now becomes manager of the Cotton Insurance Association, succeeding Guy Carpenter, who resigned in September, 1922. Mr. Proctor's successor has not yet been appointed.

Mr. Proctor is a native of Tennessee, where he was born thirty-nine years ago. He studied engineering at the State University, at Knoxville, and had served in a number of important engineering capacities before he joined forces with the marine underwriters. In 1916 the marine insurance companies took under their direct supervision the improvement and classification of cotton compresses throughout the entire South, and Mr. Proctor was engaged by them as their engineer. Two years later he took over and reorganized an activity known as the Port & Steamship Cotton Inspection Service, which maintained an inspector in each port to report on the condition of cotton for export, and also on the manner of stowage. This he consolidated with his New York bureau. Two years later he took over and reorganized a tracing bureau for the same companies, which has to do with tracing all cotton insured by them for export, and added its work to the rest.

Those eight years of work have been spent with the marine insurance companies, and the extent of Mr. Proctor's industrial influence has been evidenced in the expenditure, during that period, of between $20,000,000 and $25,000,000 for the erection of new warehouses and compresses in the South and the improvement of the fire and conflagration hazard of old risks there. That large expenditure was largely due to his initiative and was made under his supervision and direction. He now turns to fire insurance. The Cotton Insurance Association is composed of fire insurance companies doing a domestic buyers' transit business; there is no direct marine nor export connection. It also insures the legal liability of railroads on cotton; insures railroads against the spark hazard on cotton in compresses and warehouses; and also reinsures a part of the marine shore risk of the "old pool".

News in Offices

Having amended its charter, the Imperial of New York will now write marine insurance as well as fire.

New York State has licensed the Carolina of Wilmington, North Carolina, to write fire and marine insurance. The stock control of this company rests with the Home of New York, which acquired it on January 5 of this year.

Quite a bevy of New York marine underwriters have gone abroad for brief trips. Among them are F. H. Cauty, H. H. Reed, Charles R. Page, and a number of loss men and adjusters.

Samuel Bird, president of Talbot, Bird & Company, has returned from two months in Europe.

The Royal's marine department has been elected a member of the Board of Underwriters of New York, to be represented by John E. Hoffman.

George W. Lethbridge of Lethbridge & Cornwell has been elected an additional representative of the United States Merchants & Shippers to the Board of Underwriters of New York.

Cuban rail strikes are hampering business on the island through a tie-up of the roads. Food supplies are being handled in a haphazard manner, and the mail is being transported in trucks in Havana, and from port to port by war vessels. The outlook is for an extension of the trouble through the participation of additional brotherhoods.

S. D. McComb has been made a member of the executive committee of the National Fire Protection Association.

William B. Vanderhoof, manager of the New York Metropolitan marine department of the Boston, has returned from Europe.

Norman C. Charlock, an experienced marine underwriter, has joined the Newark brokerage firm of O'Gorman & Young, Inc., and is located at their New York offices at 130 Williams street.

A. Hyman & Sons have been appointed general agents for the United States and Canada of the inland marine department of the Excelsior of Syracuse.

WORLD SHIPBUILDING
(Continued from Page 433)

ship construction, therefore, now represents not far from a third of the entire shipbuilding of the world, says Lloyd's Register.

The world figures for tanker construction (including steam and motor-propelled vessels) show a slight decrease from the March 31 total. This is more than accounted for by the fact that the returns indicate that no tonnage of this type is now being built in the United States, whereas 12,000 tons were under way here three months ago. British and Irish yards show a slight gain, but the total for all other countries combined indicates a small decrease.

SHIPBUILDING AND SHIP REPAIRING

BIENVILLE LAUNCHED

ON Wednesday, July 2, the passenger steamship Bienville, under construction at the yards of the Todd Drydock & Construction Corporation in Tacoma, was launched.

The construction of the Bienville has been watched with more than ordinary interest by Todd officials in the East, as well as competing shipyards on the Atlantic Coast, for the record time made in its construction, it is believed, will lead to other contracts coming to the coast and the recognition that the Pacific Coast steel shipyards are as capable of building fine passenger vessels as are those on the Atlantic side of the country.

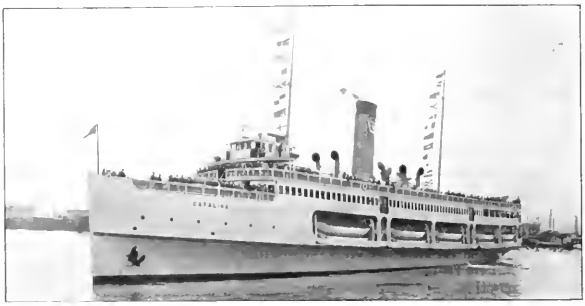
The Bienville is a handsome vessel built for the Southern Pacific Company. She will be put in the New Orleans-New York passenger run and is the last word in up-to-date equipment.

She is 445 feet long and has a beam of 57 feet. Her propelling power is furnished by turbine engines developing 7500 horsepower and capable of driving the vessel through the sea at a sustained speed of 16 knots.

She will have five decks and accommodations for the 237 cabin passengers will be the last word in luxuriousness and comfort.

In addition to facilities for 237 cabin passengers she will also accommodate 111 in the steerage.

The Bienville is named for one of the first families of Louisiana when that state was under French rule. The family was one of the most aristocratic of those who sought their fortunes in the new world. The vessel which will bear their name is regarded as an aristocrat among the many passenger vessels in service on the Atlantic Coast.



Steamer Catalina recently completed by the Los Angeles Shipbuilding & Drydock Corporation.

NAVAL SETTLEMENTS

The Navy Department has announced settlement of claims with five shipbuilders amounting to $22,221,280, for $11,639,000 arising from scrapping of seven battleships and four cruisers under the arms limitation treaty. The companies receiving the settlement are: Newport News Shipbuilding & Drydock Company, $15,114,000 settled for $6,994,000; New York Shipbuilding Corporation, $14,665,000 settled for $1,098,000; Bethlehem Shipbuilding Corporation, $1,574,000 settled for $1,014,000; General Electric Company, $1,618,000 settled for $1,379,000; Westinghouse Electric Company, $2,248,000, for $1,152,000.

The claims from the shipyards and electric companies grew out of cancellation of contracts for construction of war ships upon these companies had been working when the naval reduction treaty was put into effect.

A MODEL STATEROOM

A model stateroom, in which will be tried out the latest and most modern equipment for the comfort and convenience of passengers, will be built in the Matson Building, San Francisco, by the Matson Line's passenger department to try out everything from berth lights and wardrobes to carpets, berths, and beds. The equipment finally decided on will be installed in the Matson express passenger liner to be built by William Cramp & Sons Ship & Engine Building Company.

NEW WOODEN SHIPYARD

A new wooden shipyard has been started facing Salmon Bay, Seattle, by the Crosby Marine Corporation. The yard is located on a part of the site of the war-time plant of the Meacham & Babcock Shipbuilding Company. R. W. Crosby, president of the corporation, states that the shipbuilding plant will be operated as a subsidiary of the Crosby Marine Corporation and he will be associated in the new business with Herman Sandstrom and S. P. Langmaid, Seattle shipbuilders. The company has an order for a 65-foot diesel-powered tugboat for Henry Finch, submarine diver.

Ballroom of the steamer Catalina.

Work in Prospect

The Atlantic Refining Company is planning to convert three of its tankers to diesel-electric drive. One of them, the Allentown, of 8000 tons deadweight capacity, is to have a diesel motor of 2300 horsepower, supplied by the Ingersoll-Rand Company, the Westinghouse Company to supply the electric apparatus.

* * *

The Shipping Board has announced its intention of allowing all companies equipped to install diesel engines to submit bids for the conversion of the twelve Shipping Board laid-up vessels which are to be converted to motorships in accordance with the Edmonds bill. Of the twelve vessels selected, six will be of the standard 8800 deadweight ton type and six will be of the 9400 deadweight ton Moore type. These vessels will be fitted with single-screw engines of 2400 to 2600 shaft horsepower, operating at 90 to 100 revolutions a minute, giving a loaded speed of approximately 11 knots.

* * *

A twin screw motor vessel for Great Lakes and canal service is being planned by George G. Sharp, naval architect, 30 Church street, New York. The vessel is to be 250 feet long and engined with diesel engines.

* * *

Cox & Stevens, naval architects of New York, are receiving bids for reconditioning the seagoing yacht Hirondel for W. R. Hearst, work to cost from three to five hundred thousand dollars.

* * *

Plans have been prepared for the Baltimore & Philadelphia Steamship Company, operators of the Ericsson Line, and bids asked for the construction of two new passenger steamers to operate through the Delaware and Chesapeake Canal as soon as this waterway has been completed at sea level. Each will have a capacity of 3000 passengers. Plans have also been prepared for two auxiliary freight steamers for winter service, all to be in readiness for operation before the close of 1925.

* * *

It is reported the Atlantic Gulf & Pacific Company, 13 Park Row, New York, will place a contract for the construction of a diesel-electric seagoing dredge during the late summer or early fall.

* * *

The Standard Oil Company proposes to install diesel engines in its three tankers, the S. V. Harkness, Josiah Macy, and Trontolite.

* * *

Recent Contracts

William Cramp & Sons Ship & Engine Building Company has the contract from the Matson Navigation Company, San Francisco, for a steel express passenger liner to cost $4,792,000 and to be completed in two years. Specifications are: 552 feet L. B. P., 76 feet beam, 26 feet loaded draft, 23 knots speed, and a displacement of 18,000 tons; to be propelled by turbo-electric engines of 20,000 shaft horsepower.

Bethlehem Shipbuilding Corporation, Ltd., Sparrows Point Plant, has order for two steel dump scows for the Arundel Corporation.

Newport News Shipbuilding & Drydock Company has contract for the construction of a steel seagoing diesel-propelled yacht for Alfred I. DuPont; 130 feet long, 22 feet beam, to cost about $225,000.

Globe Shipbuilding Company, Buffalo, New York, has an order from the Connelly Transportation Company, Buffalo, for a twin screw 800-brake horsepower diesel-engined vessel for carrying grain.

Staten Island Shipbuilding Company, New York, has received contract from the Department of Plant and Structure of New York City for three double-end ferryboats designed particularly for vehicular traffic on a bid of $248,340 each. They are to be 150 feet long over guards, with a beam of 53 feet over guards. They will be propelled by two vertical compound surface condensing engines, coupled together on one shaft with a screw propeller on each end. Steam will be supplied by water tube boilers.

Tebo Yacht Basin, New York, was awarded contract by the Department of Plant and Structure of New York City for three ferryboats similar to those described above on a bid of $248,340 each.

Keel-layings

Cargo steamer. Bethlehem Shipbuilding Corp., San Francisco, for the Hawaiian Meat Co., June 17; two ferry steamers, Richmond & San Francisco Transp. Co., June 19 and 26.

Two carfloats, Bethlehem Shipbuilding Corp., Sparrows Point Plant, for B. & O. R. R., June 9 and July 1.

Bulk freighter, Great Lakes Engineering Works, River Rouge, Mich., Columbia S. S. Co., June 1.

Two carfloats, Sun Shipbuilding Co., Chester. Pa., for B. & O. R. R., July 2.

Launchings

Bienville, passenger and freight steamer, Todd Drydock & Construc-

tion Corp., Tacoma, Wn., for Southern Pacific Co., July 16.

Two deck barges, Nashville Bridge Co., U. S. Engineers. June 17 and July 8.

Deliveries

Dan F. Hanlon, steam schr. by Hanlon Drydock & Shipbuilding Co., July 3.

Catalina, excursion stmr., Los Angeles Shipbuilding & Drydock Corp., to Wilmington Transp. Co., July 1.

Light vessel 111, Bath Iron Works, Ltd., Bath, Maine, to U. S. Dept. of Commerce, June 17; Aras, yacht, to Hugh J. Chisholm, June.

New York, passenger vessel, Bethlehem Shipbuilding Corp., Sparrows Point Plant, to the Eastern Steamship Co.. June 30.

Reomar III, yacht, Defore Boat & Motor Works, Bay City, Mich., to R. E. Olds, July 1.

Two dump scows, Great Lakes Engineering Works, to Great Lakes Dredge & Dock Co., June 25 and July 7.

Sand and gravel barge, Midland Barge Co., to E. T. Slider Co., June 29.

Greenbrier, lighthouse tender, The Charles Ward Engineering Works, Charleston, W. Va., June 20.

Repair Awards

The Albina Marine Iron Works, Portland, Oregon, have a contract from the Shipping Board for replacing lower half of stern frame of the West Cayote, at a cost of $14,250. Other repairs to the steamer will bring the cost up to approximately $24,000.

* * *

Bethlehem Shipbuilding Corporation, San Francisco, was awarded contract for overhauling the Shipping Board freighter West Holbrook and putting her in condition for spot service on a bid of $6176.50. This company also performed general overhaul and betterments to the Army transport Grant on a bid of $27,954.

* * *

Matthew Shipbuilding Company, Portland, Oregon, was awarded a contract by the Coast Guard for twenty picket boats at a cost of $4090 each and the Navy Yard at Bremerton, Washington, was given an order for ten picket boats at $3740 each. Orders for forty boats were awarded to Atlantic Coast yards as follows: John M. Rogers, Inc., Gloucester City, New Jersey, ten boats at $4090; Coast Guard Depot, Curtis Bay, Maryland, five boats at $4090; Gibbs Gas Engine Company, Jacksonville, Florida, fifteen boats at $4190; Greenport Basin & Construction Company, Greenport, New York, ten boats at $5970.

* * *

The Public Works Department at Mare Island Navy Yard has asked for $130,000 to place the yard subbase in first class shape. Part of the money will be used to repair the wharf which fell into the bay several months ago due to the inroads made into it by teredo worms.

* * *

The Portland (Oregon) district of Army Engineers will build two tugs for towing rock barges on Coos Bay. The tugs will be built at the Linnton mooring grounds of the government engineers. The tugs will be equipped with 150 horsepower diesel engines. The army Engineers considered bids from private yards too high for the work and decided to build the hulls themselves.

* * *

Newport News Shipbuilding & Drydock Company expects to receive contract for a passenger and freight liner for the New York & Porto Rico Steamship Company to cost approximately $2,250,000. The vessel will be 428 feet over all, will have accommodations for 300 passengers and for about 5000 tons of freight. Refrigerating space will be installed. The propelling machinery will consist of Newport News-Curtis Brown double reduction geared turbines.

* * *

C. W. Wiley, president of Todd Dry Docks, Inc., Seattle, is building an ocean-going yacht for himself at the Todd plant at Harbor Island, Seattle. The cruiser will be 116 feet over all, 7 feet draft, and 20 feet beam; she will be equipped with two full Winton diesel engines of 150 horsepower each and will have a cruising radius of 15 days.

* * *

Mare Island Navy Yard will convert the Army transport Argonne to a submarine tender on the transport's return from her present voyage to Asia. It is expected that the conversion work will take 10 months. When it is completed, the Argonne will take a station with the fleet and will be tender for two submarine divisions, including two new undersea craft of the V-1 type now being built.

* * *

William Cramp & Sons Ship & Engine building Company has awarded the General Electric Company contract to furnish the electric propulsion equipment for the new Matson liner.

* * *

The Oceanic Steamship Company is expending several hundred thousand dollars in the reconditioning of the Australian line steamers Sonoma and Ventura, which work is being carried by the Union Plant of the Bethlehem Shipbuilding Corporation. Improvements will be chiefly confined to passenger accommodations in order to make these vessels as high class as the newly reconditioned liner Sierra.

Progress of Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT Potrero Works

Purchasing Agent: O. W. Smith.

No name, hull 5222, cargo steamer, Hawaiian Meat Co.; H. Dalton, Jr., Engr.; 400 loaded draft; 12 mi. speed; TE engs, 1000 IHP; 4 B&W boilers; keel Dec17 24; launched Mar25 25; est. delivered May 25.

No name, hull 5223, ferry steamer, Richmond & San Rafael Ferry Co.; 204 LOA; 44 ft beam; loaded draft; 6 mi speed; TE engs, 3 Scotch boilers; keel June19 24; launched Nov1 24; est. delivered Dec1 24.

No name, hull 5324, ferry steamer, sister to above; keel June26 24; launch Dec1 24; est. delivered Dec15 24.

No name, hull 5325, ferry steamer, sister to above.

A. W. de YOUNG Alameda, Calif.

Purchasing Agent: R. J. O'Connor.

Barge No. 1, 1,800 LBP; 52 beam; 12 loaded draft; keel Aug1 24; launch May31 25; est. delivered June 25; est.

Barge No. 2, sister to above; keel April 24; launch May31 25; est. delivered June 25; est.

No name, hull [illegible], Coast Guard service, 250 LBP; [illegible] speed, 2 1000 IHP steam engs; keel [illegible]; launched [illegible]; est. delivered [illegible].

No name, hull [illegible], [illegible]; keel [illegible]; launched [illegible]; est. delivered [illegible].

No name, hull [illegible], [illegible]; keel [illegible]; launched [illegible]; est. delivered [illegible].

No name, hull [illegible], [illegible]; keel [illegible]; launched [illegible]; est. delivered [illegible].

No name, hull [illegible], [illegible]; keel [illegible]; launched [illegible]; est. delivered [illegible].

No name, hull [illegible], [illegible]; keel [illegible]; launched [illegible]; est. delivered [illegible].

HANLON DRYDOCK & SHIPBUILDING COMPANY Oakland, Calif.

Purchasing Agent: W. Bekins.

Dredge Hercules, hull [illegible], steam suction dredge; keel [illegible]; launched [illegible]; est. delivered [illegible].

Harlot; 2500 DWT; 1400 IHP engines; 2 BA W. boilers; launched Mar17 24; delivered July 3 24.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION San Pedro, Calif.

Purchasing Agent: L. A. Hansen.

Catalina, hull 42, excursion stmr; Wilmington Transp. Co.; 285 LBP; 32 beam; 14 loaded draft; 16 loaded speed; twin screw; 2 cyl TE engs, 3600 IHP; 4 B&W boilers; keel Dec26 23; launched Mar24 24; delivered July1 24.

THE MOORE DRY DOCK CO. Oakland, Calif.

Purchasing Agent: N. Levy.

No name, hull 167, oil barge, Associated Oil Co., S. F.; 140 LBP; 30 beam; 7.6 loaded draft; Pacific steel engs; 2 300 IHP; keel May24; launch Aug24; est. deliver Sept24; est.

NAVY YARD Puget Sound

Medusa, repair ship for government; 460 LBP; 70 beam; 26 ft 1 in loaded draft; 17+ loaded speed; triple exp. 2 500 IHP; 2 WT express type boilers; 2 propellers; keel Jan 2 24; launched Nov25 24; est. deliver March 25; est.

Holland, submarine tender for government; 460 LBP; 60 beam; 20 ft 6 in loaded draft; 17 K loaded speed; triple exp. 2 500 IHP; two WT express type boilers; 2 propellers; keel April 21; launched Nov25 24; est. delivered April 25; est.

JAS. ROBERTSON SHIPYARD Alameda, Calif.

Coast Guard, hull [illegible], ferry boat, Richmond-San Rafael Ferry Co.; [illegible] LBP; [illegible] beam; [illegible] loaded draft; [illegible] speed; [illegible] IHP engines; [illegible] boilers; keel [illegible]; launched [illegible]; est. delivered June21 24.

TODD DRYDOCK & CONSTRUCTION CORPORATION Tacoma, Wash.

[illegible], hull [illegible], steam vessel; [illegible] Steamship Co.; [illegible] LBP; [illegible] loaded draft; [illegible] knots speed; [illegible] DWT; keel [illegible]; launched July16 24; [illegible].

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty coal barges, Carnegie Steel Co.; 175x26x11; 16 delivered.

Nineteen barges, U. S. Engineers, Louisville, Ky.; 110x26x6-6; 11 delivered.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft.; deliver 1924, est.

Sixteen barges, U. S. Engineers, Louisville; 110x26x6-6; deliver Oct1/24, est.

Eight barges, U. S. Engineers, Florence, Ala.; 120x35x7; deliver July and Aug/24.

Fifteen barges, Amer. Steel & Wire Co., Pittsburgh; 100x26x9-3; deliver 1924.

Twelve barges, Penn. Coal, Iroo & R. R. Co.; 140x25x8-6; deliver summer 1924.

THE AMERICAN SHIP BUILDING COMPANY Lorain, Ohio

W. H. Gerhauser, vice-president and director of purchases.

Greater Detroit, hull 785, paddle stmr, Detroit & Cleveland Nav. Co.; 535 LBP; 98 beam; 16 loaded draft; 20 mi loaded speed; 3 cyl comp engs, 10,000 IHP; 6 SE and 3 DE Scotch boilers, 14x20; keel Feb10 23; launched Sept14/23; deliver spring 1924.

Greater Buffalo, hull 786; sister to above; keel May... 23; launched Oct27 23.

Henry Ford II, hull 788, bulk freighter, Ford Motor Co.; 590 LBP; 62 beam; 20 loaded draft; 13 loaded speed; 12,000 DWT; 3300 IHP; Doxford diesel engs; keel Dec10/23; launched Mar 1 24.

BATH IRON WORKS, LTD. Bath, Maine

Purchasing Agent: J. L. P. Burke.

Depot vessel 111, hull 92, second-class light vessel, U. S. Dept of Commerce; 109.6 LBP; 28 beam; 14.4 loaded draft; 9½ speed; comp engs, 1 IHP; 2 Scotch boilers, 10-6x11-5; keel Aug. [illegible]; launched June14 24; delivered June 17 24.

Aras, hull 96, yacht for Hugh J. Chisholm; 138.4 LBP; 18-6 beam; 5-6 loaded draft; 15 mi loaded speed; two 6-cyl gas engs, total 1HP 2 keel Dec 23; launched Mar17/24; delivered June3 24.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT
Quincy, Mass.

Lexington, hull 1300, airplane-carrier, U.S.N. Massachusets, hull 1400, battleship U.S.N.; to be scrapped.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT
Wilmington, Del.

Hull 3490, carfloat, C. R. R. of N. J.; 325 LB P; 38-6 beam; 1030 gross tons; keel May1 24.
Hull 3491; saem as above; keel May14/24.
Hull 3492, carfloat, Erie Railroad; 325 LBP; 38-6 beam; 1030 gross tons.
Hull 3493, carfloat, sister to above.
Hull 3494, carfloat, Bush Terminal; 275x37-6 x10.
Hull 3495; sister to above.

BETHLEHEM SHIPBUILDING CORPORATION, SPARROWS POINT PLANT
Sparrows Point, Md.

New York, hull 4219, passenger vessel Eastern Steamship Co.; 385 LBP; 72-6 beam; 23-9 molded depth; twin screw turbine engs, 6400 HP; 6 Scotch boilers; keel Apr3 23; launched Jan12 24; delivered June30 24.
Hull 4220, carfloat, B. & O. R. R.; 283x37-6 x10-3; keel June9 24.
Hull 4221, sister to above; keel July1 24.
Hulls 4232-4233, steel dump scows, Arundel Corporation.

CLINTON SHIPBUILDING & REPAIR COMPANY
Philadelphia, Pa.

No name, hull 45, oil barge, City of Phila.; 88 LBP; 30 beam; 8 loaded draft; keel June /24, est; launch July/24, est; deliver Aug/24, est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2764, 30-ft cruiser, H. W. Hanan.
Hull 2765, 34-ft play boat, J. F. Brown; 150 HP Speedway engs.
Hull 2767, 40-ft cruiser, F. S. Shitten; 180 HP Speedway engs.
Hull 2769, play boat, Wilson Marshall; 34x 8-6; 150 HP Speedway engs.
Hull 2770, fishing boat, J. F. Byers; 54x— 180 HP Speedway engs.
Hull 2773, Exp. cruiser, Harold Vanderbilt; 46x10-6; 180 HP Speedway engs.
Hull 2774, cruiser, J. B. Ford; 85x15; 2-300 HP Speedway engs.
Hull 2775, yacht tender, A. F. Deck; 28x— 28 HP Speedway eng.
Hull 2777, cruiser, M. M. Belding; 50x12; 2 M-6 Speedway engs.
Hulls 2778-9, play boats for stock; 24x8.
Hull 2780, steel cruiser, W. O. Briggs; 114-21; 2 180 HP Winton diesel engs.
Hull 2781, coupe yacht tender, E. H. Bruce; 28x6-4, Gold Cup Packard eng.

COLLINGWOOD SHIPBUILDING COMPANY
Collingwood, Ontario

Royalton, hull 73, bulk freighter, Marshall Steamship Co.; 536-6 LBP; 58 beam; 23 m molded depth; 13,000 DWT; 13 mi, loaded speed; 2— h.p. TE engs; 3 Scotch boilers, 14-11-9; keel Dec31/23; launch Aug24/24, est; deliver Sept 15/24, est.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.
Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr

Marblehead, hull 502, scout cruiser, U.S.N.; keel Aug4 20; launched Oct9 23; 62 [illegible] comp; July1 24.
Memphis, hull 503, scout cruiser, U.S.N.; keel Oct4 20; launched April7 24; 21 knots; cert c mp; July1 24.
No name, hull 509, triple screw passenger and freight stmr, Matson Navigation Co.; 552 LBP; 76 beam, 26 loaded draft, 21 knots speed; 18,000 tons displ; turbo-electric engs, 20,000 SHP.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

Purchasing Agent: G. O. Williams

No name, hull 61, yacht, builder's account; 98 LBP; 15 beam; 6 draft; 14 speed; Standard gas engine; keel June 25 23; launched Aug 6/ 23; delivery July15 24, est.
Reomar III, hull 70, R. E. Olds, 139 LBP; 18-6 beam; 4 loaded draft; diesel engs 2— IHP; keel Sept1 23, launched N ov15; delivered July 1 24.
Two steel car floats, Erie R. R.; 150 long; 34 beam, 8 depth; delivered June25 24.
Yarrela, hull 76, yacht, Aaron De Ross; 92 LBP; 13-6 beam; 4 loaded draft; 1— IHP gas engs; keel Mar8 24; launched Jun25 24, est.
C. G. 115-129, [illegible] boats for U. S. Coast Guard; 75 long, 13— beam.

DRAVO CONTRACTING COMPANY
Pittsburgh, Pa.

Hulls 2[illegible] inc. 7 steel barges, Mississippi River Commission, Memphis; 430 gross tons each.
Hulls 319-327, inc. 9 steel derrick boat hulls; 115 gross tons each; for U.S Engineers, Louisville, Ky.
Hull 332, steel barge, U.S Engineers, New Orleans; 120x36x7; 430 tons.
Hull 333, sand digger; Ohio River Sand Co., Louisville; 155x42x7-6; 430 tons.
Hull 334, sand digger, Keystone Sand & Supply Co.; 155x42x7-6; 430 tons.
Hulls 335 and 336, 2 derrick boat hulls; 40x 4x5-6; ft; builder's account; 150 gross tons.
Hulls 337-40, 4 steel deck barges, builder's account; 135x30x6-6; 315 gross tons ea.
Hulls 341-4, 4 sp[illegible] and gravel barges, builder's account; 135x27x8; 32[illegible] gross tons ea.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent: R. S. Page.

No name, hull 81, freight stmr, Shipping Pa- cific Co.; 433 LBP; 56 beam; 26 loaded draft; 14 mi. speed; 7,[illegible] DWT; turbine engs, [illegible] HP; 4 B&W boilers.

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent: Chas. Short.

Benson Ford, hull 245, bulk freighter, Ford Motor Co.; 586 LBP; 62 beam; 20 loaded draft; 13 mi. speed; 13,500 DWT; 3300 HP Doxford engs; keel Nov26 23; launched Apr26 24; deliver July25 24, est.
Edvard L. Bean Jr, hull 247, freighter, Frank- lin S. S. Co., Cleveland; 618 LOA; 586 LBP; 62 beam; 32 depth; 20 loaded draft; 13,500 DW T; 12 mi speed; keel Feb25 24; launch Aug1/ 24, est; deliver Oct1 24, est.
No name, hull 248, bulk freighter, Columbia S. S. Co., Cleveland; 618 LOA; 592 LBP; 62 beam; 32 depth; 20 draft; 13,500 DWT; 12½ mi speed; keel June1 24, deliver Mar5 25, est.

GREAT LAKES ENGINEERING WORKS
Ashtabula, Ohio

Hull 538, [illegible] screw, Great Lakes Dredge & Dock Co.; 181 LOA; 40 beam; 12 loaded draft;

1000 yards capacity, keel Mar./24; launch June12, 24; est. delivered June25 24.

Hull 519, sister to above; keel Mar15'24; launched June24, 24, est., delivered July7, 24.

HOWARD SHIP YARDS & DOCK COMPANY
Jeffersonville, Ind.

Purchasing Agent: Jas. E. Howard.

Steel tow-boat, 140 long; 32 beam; 6½ depth hold.

Two steel river boats, U. S. government.

No name, Algiers Public Service, Inc., New Orleans; 150 feet 6 inches long.

No name, ferryboat, sister to above.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Pere Marquette 21, hull 209, car ferry, Pere Marquette Ry. Co.; 348 LBP; 58 beam, 16 loaded draft, 14 mi. loaded speed; 2 sets TE engs., 2750 total IHP; 4 Scotch boilers, 13ft. 3in. dia., 12ft. 6in. long; keel Oct1,23, launched Mar18/24; deliver May 24, est.

Pere Marquette 22, hull 210, sister to above; keel Dec20'23; launch September, 24.

Hull 211, steel barge, War Dept. U.S.gov.; 175 ft long, 40 ft molded beam, 11 ft 6 in molded depth; keel Mar28, 24.

Hull 212, steel tug, Great Lakes Dredge & Dock Co., Chicago; 75 ft long, 21 ft molded beam; 11 ft molded depth, 300 HP Fairbanks Morse CO engs., keel Jan12 24, launch April/24, est.

Hull 213, sister to above; keel Jan19, 24; launch April 24, est.

MARIETTA MANUFACTURING CO.
Point Pleasant, W. Va.

Purchasing Agent: A. S. Wetherall.

Sailor, hull 140, steel towboat, Jones & Laughlin Steel Corp.; 164' LBP; 36 beam; 7.6 depth; 163 gross tonnage, 16x42x8 ft. tandem compounds, western river setting; Sellers boilers; keel Oct 1/23, launched March 24, delivered July15, 24, est.

No name, hull 145, steel vessel; 124'x32'x12'6" to be long name type; Western rivers return tubular boilers; keel March 24, est.

No name, hull 146, sister to above; keel May 15 24, launch June24, 24, est., deliver July15, 24, est.

MIDLAND BARGE COMPANY
Midland, Pa.

Purchasing Agent: H. S. No. 2.

Hull 34, steel oil barge, J. J. Snider Co., New Alliance; 150 LBP; 26 beam; 400 DWT, keel June 24, launched and delivered June29, 24.

MIDLAND SHIPBUILDING COMPANY, LTD.
Midland, Ontario

Purchasing Agent: R. S. McLachlin.

Glenmore, hull 12, bulk freighter, Great Lakes Transp. Co.; 600 LOA; 60 beam; 26 draft; 3 Scotch boilers; keel May 24, launch fall 1924.

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

No name, hull 1, dredge, W. T. Hunter & Co.; 100 LBP; 30 beam; 6 loaded draft; keel July15, 24, est.; deliver Sept. 24, est.

Hulls 46-52, inclusive, U. S. Engineers, Cincinnati; 40 LOA; 12 beam; 3 loaded draft; keels June1, 24, est.; deliver Aug15, 24, est.

Hull 53, steel barge, Gt. Lakes, Louisville; 120x30x7½ ft.; keel April 24, launched June 17 24, deliver July7, 24, est.

Hull 57, steel barge, sister to above; keel May22 24; launched July8 24, est.; deliver Aug1, 24, est.

Hull 58, stock barge, builder's account; 100 LBP; 24 beam; 5 loaded draft; keel July1 24, est.

No name, hull 81, dredge boat hull, T. L. Herbert & Sons; 110 LBP; 26 beam; 6 draft; keel July1 24, est.; launch and deliver Sept1 24, est.

NAVY YARD
Boston, Mass

Work on [illegible] 4 U.S. Navy; 460 LBP; [illegible] 21 loaded draft; 16 knots speed; [illegible] 2 sets geared turbine engs., [illegible] HP; 2 WT boilers; keel Oct. [illegible] launched June 15/24; deliver July 15/24, est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing [illegible] U. S. Navy, New York.

George Washington, hull 276, freight and passenger stmr, Old Dominion Steamship Co.; 375-6 LBP; 53 beam; 29-9 depth; speed 16 knots; 2100 DWT; Newport News Curtis turbines, 4750 SHP; B&W boilers; keel Mar10, 24, launch Sept /24, est.; deliver Nov, 24, est.

Robert E. Lee, hull 277, sister to above; keel March 24; launch Oct 24, est.; deliver Jan 25.

No name, hull 274, combination steamer, Clyde S. S. Co.; 387-6 LBP; 54 beam; 31-6 depth; 14½ loaded speed; 2600 DWT; Newport News Curtis engs.; 4200 SHP; 4 Scotch boilers, keel Aug 24, est.

No name, hull 275, sister to above; keel Sept 24, est.

No name, hull 281, yacht for Alfred I. du Pont; 130 LBP; 22 beam, twin screw; diesel engs; deliver Dec 24, est.

NEW YORK SHIPBUILDING CORP.
Camden, N. J.

Purchasing Agent: L. G. Buckwalter

Hulls 2934, two carboats, Harlem Transfer Co., N. Y.; 3 tracks, 27 long; keels spring, delivered summer, 1924.

Hulls 296-9, four carboats, N. Y. Cent. R. R. Co.; 2 tracks, 366 long; keels spring, deliver summer, 1924.

THE PUSEY AND JONES CO.
Wilmington, Del.

Purchasing Agent: James Bedford.

District of Columbia, hull 1028, steel tow stmr., Norfolk & Washington Steamboat Co., Washington, D. C.; 207'7 LBP; 31 beam; 14 loaded draft; 1200 IHP; 1 DW speed; 1000 DWT; single screw, 4 cyl. TE engs; 2400 IHP; 4 Scotch boilers, 12'6; keel May3 24, deliver August 24, est.

SPEDDEN SHIPBUILDING CORP.
Baltimore, Md.

Purchasing Agent: W. I. C. Ilsom.

M. M. Davis, hull 270, boiler tug, A. T. Taylor & Bro.; deliver May30 24, est.

Hull 271, steel hull tugboat, Grace Line, Inc., N. Y.; 70-6 LOA; 19 beam; 11 depth; 325 IHP Ingersoll Rand diesel engs; deliver Nov 24, est.

STATEN ISLAND SHIPBUILDING COMPANY
Staten Island, N. Y.

Purchasing Agent: R. C. Meier.

No name, hull 749, steel vessel to be tug boat, Penn R. R. Co.; 115 LBP; 24 beam; 13' loaded draft.

No name, hull 750, steel diesel-electric tug boat, Atlantic Refining Co.; 94 LBP; 21 beam; 11.5 loaded draft.

No name, hull 751, sister to above.

No name, hull 752, sister to above.

SUN SHIPBUILDING COMPANY
Chester, Pa.

Purchasing Agent: H. W. Scott.

W. L. Marshall, hull 59, hopper dredge for Engineers; 245 LBP; 46 beam; 19'6" draft; 1500 loaded speed; 2000 DWT; [illegible] electric drive; keel March 23, launched [illegible] 23, delivered June14 24.

Harry Kingman, hull 60, sister to above; keel March 23, launched March 24, deliver Aug 1 24, est.

Wm. J. Rossell, hull 61, sister to above; keel June 23, launch May21, 24, deliver July15 24, est.

Hull 81, carboat, B. & O. R. R.; 288 LOA; 37-6 beam, 10-3 depth; keel July2 24; launch Sept6 24, est.; deliver Sept25 24, est.

Hull 82, sister to above; keel July2 24; launch Sept6 24, est.; deliver Sept25 24, est.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Greenbrier, hull 21, U.S. Lighthouse tender; 164-6 long by 32-6 by 9-6; 2 non-condensing HP engs., 15-inch diam cylinder, 84-in stroke; 3 Mississippi River type boilers, 26 ft long, coal burning, natural draft; keel June26, 23; launched Nov13 '23; delivered June20 24.

C. B. Peters, hull 21, 24-in pipe line dredge, U.S. Engineers, Cincinnati, O.; 175 long by 50 by 8½; pumping engs., 1000 BHP McIntosh & Seymour diesel-2 cyc. 225 BHP McIntosh & Seymour engs.; keel Sept20 23; launched Feb21/ 24; deliver Aug4 24, est.

Lookout, hull 33, towboat, U.S. Engineers, Nashville, Tenn.; 116 ft long; 29 ft beam; 5-6 depth; 2 surface condensing tandem compounds, 300 HP; 3 watertube boiler; coal burning; natural draft; keel Apr17 24; launch June14 24, est.; deliver Sept29 24, est.

No name, hull 34, quarter boat, U. S. Engs., Huntington, W. Va.; 106 long; 26 beam; keel July12 24, est.; launch Aug9, 24, est., deliver Aug15, 24, est.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD., UNION PLANT
San Francisco
Potrero Works

Drydock, paint, misc.: Priscilla, Chas. R. McCormick, Invader, Shell Oil Barge No. 1, Richmond, Tosca, Horace Luckenbach, Orowatti (also engine, boiler, hull), Nancy Lee, Atlas, W. S. Miller, U. S. A. T. Grant, Manukan (also engine, boiler, hull), West Cahokia. General reconditioning: Sierra (ex Gdansk). Hull and engines: Los Alamos, Waiotapu (also hull and steward's dept.), ms. Hauraki (also hull and steward's). Engine: Spirula, Cathwood, Silver Shell, Finland, Gedama, Sudawsonco, Velocita, Watertown, Atlantic Sun, George Washington, Denebic, San Pedro (also hull). Reconditioning: Sonoma. Install Cloverleaf propeller: Despatch No. 2. Engine, boiler, hull: Matsonia, Oaxaca, Wilhelmina, Eureka, Admiral Fiske, Chapas, Guerrero. Drydock for survey, misc.: Hagen. Pipe repairs, C. T. Dodd, Bandelia, Marions H. Whittier, San Jasper. Install steam cooker: Pennsylvanian. Furnish and install 24 Dahl burners: Korea Maru. Propeller: Admiral Schley, Vaquero. Propeller: Cuba. Misc.: Dakotan, Cambrai, Oleum, President Wilson, Coahiga, Florida, Floridian, Manulani, Makaweli, Rose City, Californian, Missourian, Sea Rover, E. Burnell, Sydney, F. H. Hillman, Keenland, W. S. Miller, Kentuckian, President Lincoln, Hartwood, Los Angeles, President Adams, W. S. Rheem, Panaman, Manchuria, Manukan, D. G. Scofield, E. M. Phelps, Texan, El Segundo, Shabonee, Mojave, Hanover.

San Pedro Works

Drydock and misc.: Admiral Schley, Los Alamos, tug Pilot, Emelio, West Sequana, Avalon, J. D. Ralston, C. Teague, Emma Alexander, San Gregorio, El Lobo. Misc.: tug Sea Lark, stmr. Olympic, Montebello, La Crescenta, Hoven.

COLLINGWOOD SHIPBUILDING COMPANY
Collingwood, Ontario

[illegible] damage repairs: W. D. Matthews, [illegible] Riverton. Bow damage repairs, [illegible] Murray Stewart. New blade [illegible] Henry Pedwell. Misc.: Drill Scow No. 5, Manitou.

LOS ANGELES SHIPBUILDING & DRYDOCK CORP.
San Pedro, Calif.

Dock, clear, paint, misc.: Santa Maria (also [illegible] in connection for changing to American registry), yacht Pinnsettia, Vancouver, Baltic (also engine, hull, boiler), Yale, Yorba Linda. Complete alterations: City of Los Angeles. Docked for extensive bottom damage and misc.: Abelodite, Engine: Kakaako, Kauai (also hull), Catalina (also deck), Vistula (also piping), F.B. Protector (also piping). Hull: Vaquero, A. C. Bedford, tug Peacock (also misc.) Drydock propeller repairs: yt. Sea Gull. Engine, boiler, hull: Allen Anderson, Tascalusa. Misc.: Dutch Patrick, schr. Speedway, launch Freedom, tug Fairfield City, Tecumseh, El Cedro, F. H. Hillman, schr. Black Bridge, Seattle, Mc-Mullen, stmr. S. C. T. Dodd, El Abeto, El Cuenta, Iowa.

MOORE DRYDOCK COMPANY
Oakland, Calif.

Drydock, bottom damage repairs, align main engines, shaft and misc.: Frank H. Buck. Drydock, clean, paint, misc.: President Cleveland, U. S. A. T. Meiges, Western Flyer, Barge No. 1, Crockett, Yanita, Santa Fe barges Nos. 1, 2, 3 and 4, Tiverton, Dilworth (engine, boiler, hull), Mexico (also engine, boiler, hull), tug Gregory Bardon and boiler: India Arrow. New service pump: Dieto. Dock, engine and propeller repairs: tug Henry I. Biddle. Hull and engines: Dilworth, Carriso, Multomah. Repairs and boilers: Yale, ferry boat San Francisco (also drydock and renew planking). Engines: Santa Cruz, Las Vegas (also deck). Renew tail-shaft: tug G. H. Payson. Misc.: Catalina Volunteer.

NAVY YARD
Bremerton, Wash.

Dock misc. repairs: Arizona. Misc.: Seattle, Wm. Barnes, Mateo, Sinclair, Decatur, Henshaw, McCawley, Eagle No. 11. Misc. repairs incidental to operation as district craft: Mahopac, Tatnuk, Swallow, Iroquois, Satoyomo, Pawticket.

TODD DRY DOCKS, INC.
Seattle, Wn.

Dock, clean, paint, misc.: Sea Monarch, Polaris, West Lepa, Admiral Watson, Bearport. Repair main steam line: Hakaga. General overhaul: Dellwood. Dock for survey, misc.: Patterson. Repair steering engine: Contra Costa. Misc.: Hannah Neilsen, Redwood, Remus, Retarian, Patrician, Luise Neilsen, Alaska Standard, President McKinley, Waialeale, President Grant, West Himrod, Harry Luckenbach, West Carlton, Zapora, President Jackson.

PERSONAL PARAGRAPHS AND ITEMS OF INTEREST

HARRY A. SHAWK has been appointed lubrication engineer of the Associated Oil Company and is now located at the Associated Oil building in San Francisco. Mr. Shawk was transferred from the Associated's office in Portland, Oregon, where for three years he was district lubrication engineer. Prior to his connection with the Associated Oil Company Mr. Shawk had important marine engineering experience, notably with the Northwest Bridge & Iron Company as inspector on engines building for them at the Hooven-Owens-Rentschler plant at Hamilton, Ohio. He served also as trial trip engineer for the Grant Smith Porter Company and as performance engineer for the United States Shipping Board.

C. G. CLINCH

A. R. Pegg is manager of the new Los Angeles Harbor branch of the C. G. Clinch Marine Paint Company of San Francisco, Southern California headquarters having been opened at 629 Beacon street. Mr. Pegg is widely known in Pacific Coast shipping circles and formerly was with the Union Oil Company fleet of tankers. The C. G. Clinch home office is 49 Drumm street, San Francisco.

A-H PIER

Fred A. Hooper of the American-Hawaiian Steamship Company announces that A-H vessels are now using municipal pier No. 40 at Philadelphia for discharge of eastbound cargoes. This pier is in the heart of the wholesale district and is served by all rail lines and offers excellent facilities for the dispatch of freight moving interior via Philadelphia. Pier No. 48 will remain under the jurisdiction of the American-Hawaiian Steamship Company for westbound cargo.

Harry A. Shawk, lubrication engineer, Associated Oil Company

OPENS ORIENT

Roscoe L. Hambleton, Inc., are opening Shanghai headquarters and are en route to establish offices in the leading commercial centers of the Orient from Shanghai to Batavia. This enterprising American firm are exclusive representatives and distributors for a complete line of automotive equipment, and the emphasis of effort is to be on marine lines—marine engines and pleasure craft and work-boat accessories. The firm will handle fast runabouts and the widely-known line of Belle-Isle and Hacker boats. Roscoe L. Hambleton sailed from San Francisco for Shanghai early in July. The organization consists of other American engineers associated with Hambleton, as well as native engineers with American technical training in each Far Eastern territory. The Hambleton house are pioneering with Yankee spirit, and it is interesting to know that they have a hydroplane of the latest type as part of their transportation equipment.

Roscoe L. Hambleton opens marine equipment firm in the Orient.

DIAMOND POWER

The Diamond Power Specialty Corporation of Detroit, manufacturers of Diamond soot blowers for water tube and horizontal return tubular boilers, have appointed W. L. Sullivan, 505 Central National Bank building, Tulsa, Oklahoma, as their representative for the state of Oklahoma.

KEENAN DEAD

Funeral services were hold recently in San Francisco for John E. Keenan, who was chief engineer of W. R. Grace & Company's steamer Santa Ana, running between Valparaiso and New York. Mr. Keenan died June 19 at Cristobal, Canal Zone, a day after a stroke aboard his vessel. Keenan saw service under the Pacific Mail and Oceanic flags and during the world war was a naval officer in European waters.

SPERRY OFFICE

J. F. McConkey, representative of the Sperry Gyroscope Company, New York, has headquarters at 326 Matson building, 215 Market street, San Francisco. The Matson building houses a number of important marine organizations and representatives.

PACIFIC MARINE REVIEW'S
INTERCOASTAL-OFFSHORE-COASTWISE
DIRECTORY
LINES SERVING PACIFIC COAST PORTS

INTERCOASTAL

SAN FRANCISCO

AMERICAN-HAWAIIAN S. S. CO.
215 Market street. Phone Douglas 9560.
FREIGHT ONLY
SAILINGS—Weekly from Seattle, Tacoma, Portland, San Francisco, Oakland, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Garfield 4300.
PASSENGERS AND FREIGHT.
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles, and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between San Francisco, Seattle, Vancouver, B. C., Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

GARLAND STEAMSHIP CORP.
244 California street. Phone Garfield 4700.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between San Francisco, Seattle, and Los Angeles and Norfolk, Baltimore, and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Intercoastal Service
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
201 California street. Phone Douglas 7000.
FREIGHT ONLY.
SAILINGS—South Atlantic - Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles, to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Co., Pacific Coast agts.
215 Market street. Phone Kearny 5100
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3600.
SAILINGS—Passengers and Freight.
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Manzanillo, Los Angeles, San Francisco
SAILINGS—Direct Freight Service.
Every 7 days. Eastward calls: San Francisco, Los Angeles. Westward: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARRIBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Offices: 460 Market street. Phone Douglas 8680.
Freight and Operating Offices: Pacific Steamship Co., 60 California St. Phone Sutter 7800.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
W. D. Benson, Pac. Coast Mgr.,
311 California street. Phone Garfield 6760.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, Pacific Coast Agents,
230 California street. Phone Garfield 2846.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
A. F. Zipf, Pacific Coast manager.
110 California street. Phone Douglas 1670.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, and New York, Philadelphia, Norfolk and Baltimore

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Bearborn, agent.
Mutual Life Building.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2480.
FREIGHT ONLY.
SAILINGS—Every 10 days between Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, [illegible]
420 L. C. Smith Building. Phone Elliott [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Los Angeles, San Francisco, Vancouver, B. C., Seattle, New York, Boston, Baltimore, Providence, Philadelphia and Portland, Me.

GARLAND STEAMSHIP CORP.
[illegible]
Colman Dock. Phone [illegible]
FREIGHT ONLY.
SAILINGS—[illegible] San Francisco, Los Angeles and Portland

MARKS HEADS EXCHANGE

Abe Marks, who has been connected with the marine department of the old Merchants' Exchange and later with the Chamber of Commerce for thirty-four years, and one of the most popular men in San Francisco shipping circles, has been made manager of the department to take the place made vacant by the death of "Jerry" Daily. It is the unanimous opinion in shipping and business circles that the appointment of Marks is well deserved and that the business of the marine department will be conducted on the same high, efficient lines that marked the management of Mr. Daily.

NAVAL OIL

The Associated Oil Company has been awarded the contract by the United States Navy Department of Supplies and Accounts to supply Pacific Coast and Hawaiian ports with approximately two-thirds of their lubricating oil requirements for the fiscal year 1925. This contract includes engine and aviation oils as well as turbine lubrication oils.

ON LEAVE

Captain Peter Johnson, master of the Matson liner Maui, is on his first vacation in thirty years ,taking a rest in Hawaii. Captain John Diggs brought the Maui home from the Islands during Captain Johnson's well-earned leave.

MAXSON AT LAUNCHING

Captain C. P. Maxson, commodore of the Morgan Line, operating the Southern Pacific Company's carriers between New York and New Orleans, was present at the launching of the new passenger and freight steamer Brenville at the Tacoma plant of the Todd Drydock & Construction Corporation on July 16.

INTERCOASTAL

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
L. C. Smith Building. Phone Elliott 1206.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
Pier 6. Phone Elliott 5367.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco, Portland, Tacoma and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
Lobby 4 Central. Phone Elliott 6383.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Office, 619 Second avenue.
Pacific Steamship Company, agents.
L. C. Smith Building. Phone Elliott 2068.
SAILINGS—Intercoastal.
Regular intervals between New York, San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
Transmarine Corporation.
4421 White Building. Phone Elliott 6127.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, agents.
Arctic Club Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
Spokane street terminal. Phone Elliott 6657.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, and New York, Philadelphia, Norfolk and Baltimore.

LOS ANGELES

AMERICAN-HAWAIIAN S. S. CO.
W. S. Matherson, agent.
Central Building. Phone 821-336.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3014.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks from Vancouver, Seattle, Portland, San Francisco and Los Angeles to New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
212 Mortgage Guarantee Bldg., 626 So. Spring St. Phone 874-891.
PASSENGERS AND FREIGHT
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Hawaii, Los Angeles and San Francisco.
FREIGHT ONLY.

SAILINGS—Intercoastal Service.
Sailings between Los Angeles, San Francisco, Seattle, Vancouver, B. C., New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

GARLAND STEAMSHIP CORP.
General Steamship Corporation, agents.
Pacific Electric Bldg. Phone TRinity 6756.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Seattle, San Francisco and Los Angeles and Norfolk, Baltimore and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES
Luckenbach Steamship Company.
208 West Eighth street. Phone Main 808.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 14 days from Vancouver, Seattle, Portland, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
Lane Mortuary Bldg. Phone Metropolitan 6140.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore ports, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

PACIFIC MAIL STEAMSHIP CO.
Passenger Offices: 503 South Spring street.
Freight Offices: 108 West Sixth street.
SAILINGS—Passengers and Freight.
Every 28 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Baltimore, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Los Angeles and San Francisco.
SAILINGS—Direct Freight Service.
Every 7 days, eastward calls: San Francisco, Los Angeles, Westbound calls: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
488 Pacific Electric Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA-PACIFIC LINE
International Mercantile Marine Company.
Freight Offices: Pacific Steamship Company, 322 Citizens National Bank.
Passenger Offices: 510 So. Spring st. Phone 872-511.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
(Transmarine Corporation)
G. T. Darragh, agent.
A. G. Bartlett Bldg. Phone 873-233.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED AMERICAN LINES, INC.
Los Angeles Steam[illegible] Company, agents.
[illegible]
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company.
Stock Exchange Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles and New York, Philadelphia, Norfolk and Baltimore.

JAMES & McNULTY CO.

James & McNulty Company is the name of a new firm organized by Thomas James, N. S. McNulty and Joe Fahy to carry on business as general steamship agents and stevedores at Los Angeles Harbor. All three men have had wide experience in the handling of vessels. Mr. James recently resigned from the Pacific Mail Steamship Company as operating manager. Mr. McNulty has been affiliated with several transportation companies on the Pacific Coast since 1912 and was engaged for two years with Mr. Fahy in a freight forwarding business in San Francisco.

I. M. M. MOVES

The new home of the International Mercantile Marine Company Pacific Coast passenger office is at 460 Market street, San Francisco, Phone Douglas 8680. T. H. Larke, Pacific Coast manager, is enthusiastic with the improved location and added facilities for rendering further convenience to prospective I. M. M. travelers using the Panama Pacific, American, White Star, Leyland, Atlantic Transport, Red Star and White Star Dominion Lines. There are 112 ships in the I. M. M. armada, 1,200,000 tons. Mr. Larke sends an invitation through Pacific Marine Review for inspection of the new quarters.

HEATH SIRENS

Electric sirens manufactured by the Heath Engineering Laboratories, Inc., of San Francisco are now being introduced to the marine field in the Pacific Northwest by L. W. Reese, who is on an extensive trip to the important shipping centers of that territory. Reese's itinerary includes Portland, Seattle, Vancouver, Tacoma, and Everett, and he is demonstrating the wide range in Heath automatic electric sirens as of service for every type of commercial craft. Among recent installations are the San Francisco pilot boats. In Seattle Mr. Reese will make his headquarters at 411 North Forty-eighth street.

BAY MANUAL

Edited and compiled for the Foreign Trade Club of San Francisco by C. A. Stuewe, an attractive and valuable book entitled "San Francisco Bay Ports Manual" has just been published. This manual contains a vast fund of authoritative information which should be of assistance to all engaged in domestic and foreign commerce. The edition is cloth-bound and permits insertion of additional data through its loose-leaf arrangement.

INTERCOASTAL

PORTLAND

AMERICAN-HAWAIIAN S. S. CO.

C. D. Kennedy, agent.
Railway Exchange Building.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE

Norton, Lilly & Company, general agents.
400 Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Portland, New York, Boston, Providence, Philadelphia and Baltimore.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES

Luckenbach Steamship Company, Inc.
Spalding Building. Phone Broadway 4378.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 14 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE

McCormick Steamship Company.
181 Burnside street. Phone Broadway 1498.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland and Seattle.

PACIFIC MAIL STEAMSHIP CO.

Norton, Lilly & Co., agents.
Yeon Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days. Eastward calls: San Francisco, Los Angeles. Westbound: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland, and Seattle.

PACIFIC-CARIBBEAN GULF LINE

Swayne & Hoyt, Inc., managers.
1008 Yeon Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE

International Mercantile Marine Company.
Pacific Steamship Company, freight agents.
Admiral Line Terminal.
SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

UNITED AMERICAN LINES, INC.

Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

VANCOUVER

ARGONAUT STEAMSHIP LINE

B. W. Greer & Son, Ltd.
602 Hastings St., West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Every 30 days, Vancouver to Montreal. Through bills of lading from other Pacific Coast ports.

DOLLAR STEAMSHIP LINE

Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Vancouver, B. C., Seattle, San Francisco, Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

ISTHMIAN STEAMSHIP LINES

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles.

LUCKENBACH LINES

Empire Shipping Company, Ltd.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Vancouver, Seattle Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Galveston, New Orleans, and Mobile.

MUNSON-McCORMICK LINE

Kingsley Navigation Company, Ltd.
602 Pacific Building. Phone Seymour 9506.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco and North Pacific Coast ports.

PACIFIC-CARIBBEAN GULF LINE

Dingwell Cotts & Co. agents.
413 Pacific Building.
FREIGHT ONLY.
SAILINGS—Monthly from North Pacific ports, San Francisco, Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports.

ORIENTAL

SAN FRANCISCO

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

Dodwell & Company.
2 Fine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.

DOLLAR STEAMSHIP LINE

The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Garfield 4300.

PASSENGERS AND FREIGHT

SAILINGS Trans-Pacific.
Fortnightly from San Francisco to Honolulu, Kobe, Shanghai, Hongkong, Manila and Singapore

FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings between San Francisco, Seattle, Vancouver, Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles.

LARGEST LUMBER CARGO

Heralding Puget Sound to the world, the largest lumber cargo ever carried on a single steamship was loaded on the steamer Lewis Luckenbach and sailed from Puget Sound the first of July bound for Baltimore and New York. The cargo consists of 7,574,000 feet of the finest lumber in the Puget Sound country; 6,650,000 feet were loaded at Tacoma, 300,000 feet at Seattle, and 550,000 feet at Everett; 500 tons of copper were also loaded at Tacoma. The cargo includes a deckload of 1,000,000 feet.

MOTORSHIPS FOR JAPAN

Although at the present time there are no large motor cargo ships in service under the Japanese flag, several will be completed and in operation by the end of the year. The first of two 9700-ton deadweight motorships for the Kawasaki Company will be launched at the Kawasaki dockyard very shortly. This vessel, which is 405 feet long between perpendiculars, with a beam of 53 feet and a depth of 37 feet, is to be engined with a Camellaird-Fullagar type engine constructed by a British firm. It is a six-cylinder unit producing 2500 brake horsepower with a speed of 98 r. p. m., while the normal speed of the ship will be about 11 knots.

Another Japanese motorship which has just been launched is the Akagisan Maru, which is being built by Mitsui Bussan Kaisha. It is one of two similar vessels being built by this company and will have a deadweight capacity of 7300 tons, length of 375 feet, and beam of 50 feet. Each of these ships will be equipped with a 2000 brake horsepower long stroke Burmeister & Wain engine.

Two motorships for the Nippon Yusen Kaisha are being built by Harland & Wolff and are to be equipped with Sulzer and Burmeister & Wain engines respectively.

NILE SOLD

The old passenger and freight steamer Nile, which has been lying idle in San Francisco Bay since she was sold last August by the government to Rosenthal & Sons, junk dealers, was reported sold recently to M. S. Berardini of Los Angeles. The vessel is being prepared at the Moore Dry Dock Company for her trip to Los Angeles Harbor. It is not known what Mr. Berardini is to do with the famous old steamer. The price paid is reported to be in the neighborhood of $100,000. Rosenthal & Sons purchased the vessel from the government for $47,800 and their original intention was to scrap her.

ORIENTAL

MITSUI & COMPANY, LTD.
(Mitsui Bussan Kaisha, Ltd.)
Merchants Exchange Bldg. Phone Sutter 3414.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NIPPON YUSEN KAISHA
Dodwell & Company, Ltd.
2 Pine street. Phone Sutter 4261.
FREIGHT ONLY.
SAILINGS—Regular service between China, Japan ports and United States Atlantic ports via Panama Canal, vessels calling at San Francisco on both outward and homeward voyages. One arrival monthly from Japan, discharging cargo at San Francisco. One to two sailings monthly homeward, occasionally loading cargo for Yokohama, Kobe and Shanghai.

OSAKA SHOSEN KAISHA
McCormick, McPherson & Latham.
503 Market street. Phone Kearny 3632.
SAILINGS—San Francisco Service (FREIGHT ONLY).
Monthly service to and from Yokohama, Kobe, Moji, Shanghai, Hongkong and Singapore.
SAILINGS—Los Angeles Service (PASSENGERS AND FREIGHT).
A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, the Panama Canal and Los Angeles.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3501.
(Operating U. S. S. B. vessels.
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific Service.
Every 14 days from San Francisco to Honolulu, Yokohama, Kobe, Shanghai, Manila and Hongkong.
SAILINGS—Hongkong-India (Freight Only.)
Connects at Hongkong every 2 weeks for India ports.

ROOSEVELT-KOKUSAI LINE
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]

STRUTHERS & BARRY
(Operating U. S. S. B. vessels
112 Market street. Phone Sutter 7043
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular intervals from Los Angeles, San Francisco, Seattle, Portland to Yokohama, Kobe, Shanghai, Hongkong, Manila, Singapore, Straits Settlements, Java, Bali and Siam. For complete sailings [illegible]

TOYO KISEN KAISHA
(Oriental Steamship Company)
549-551 Market street. Phone Sutter 3[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—[illegible]
Hongkong, Shanghai, Kobe, Moji, Yokohama, Hongkong, Shanghai, Kobe, Moji, Nagasaki, Shanghai, Hongkong, Manila.
SAILINGS—Monthly [illegible]
Intermediate Ports [illegible]
SAILINGS—FREIGHT ONLY.
Regular sailings [illegible] service and from Seattle via Panama Canal.

YAMASHITA KISEN KOGYO KAISHA
Yamashita Company, Inc., agents.
232 Robert Dollar Bldg. Phone Garfield 3399.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama, Kobe and irregular service from [illegible] Japan ports to San Francisco, Portland and Seattle.

SEATTLE

ADMIRAL ORIENTAL LINE
L. C. Smith Building. Phone Elliott 2068
SAILINGS—PASSENGERS AND FREIGHT.
Every 12 days between Seattle, Victoria, B. C., Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—FREIGHT ONLY.
Regular service to Vladivostok, Dairen, Tientsin, Tahu Bar, Tsingtao, Shanghai and Japan ports on either outward or homeward voyages, as freight offers justify direct call.
SAILINGS—Monthly service to Yokohama, Kobe, Shanghai, Fuochow, Amoy, Swatow, Manila, Cebu and Iloilo.

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., [illegible]
Stuart Building. Phone Elliott 1247.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, agents.
L. C. Smith Building. Phone Elliott 6794.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular sailings from Puget Sound [illegible] to Shanghai, Kobe, Hongkong and Manila, connecting via Los Angeles and San Francisco.

R. T. JOHNS & COMPANY
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]

MITSUI & COMPANY, LTD.
[illegible]
American Bldg. Phone Elliott 1[illegible]
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco, Portland, Seattle and Tacoma to Kobe, Yokohama, Nagasaki, Shanghai, Hongkong and Manila, thence to China and Japan.

NIPPON YUSEN KAISHA
Colman Building. Phone Elliott 2[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—Frequent intervals sailing at Victoria, Vancouver, B. C., to Yokohama, Kobe, Nagasaki, Shanghai, Hongkong and other Oriental ports as inducement offers.

OSAKA SHOSEN KAISHA
W. C. Dauser & Company, agents.
[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—[illegible]

SUZUKI & COMPANY
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]

THORNDYKE-TRENHOLME CO.
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]

WALKER-ROSS, INC.
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]

YAMASHITA KISEN KOGYO KAISHA
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]

LOS ANGELES

CANADIAN GOVERNMENT MERCHANT MARINE
[illegible]
FREIGHT ONLY.
SAILINGS—Oriental Service.
[illegible] Victoria to Yokohama, Kobe, Moji, China ports, returning via Japanese and Suez Canal ports.

DOLLAR STEAMSHIP LINE
[illegible]
PASSENGERS AND FREIGHT
SAILINGS—[illegible]
FREIGHT ONLY.
SAILING—Trans-Pacific Service.
Regular [illegible] Los Angeles, San Francisco, Seattle, Victoria, Yokohama, Kobe, Shanghai, Hongkong and Manila.

OSAKA SHOSEN KAISHA
McCormick, McPherson & Latham
General Agents.
PASSENGERS AND FREIGHT.
SAILINGS—A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong.

SHIPPING BOARD EXTENSION

F. P. Lemon, field superintendent for the Burma Oil Company, arrived in San Francisco the middle of July on his way to Washington to ask the United States Shipping Board for a more adequate feeder service between Burma and India and also to request that the present service between Hongkong and Calcutta be maintained and increased. It is the desire of the natives as well as the Americans in Burma, according to Mr. Lemon, to see the volume of business handled by the Shipping Board increased, and if the Board would give these people some bona fide assurance that the American tonnage in the various feeder routes will be increased sufficiently to meet the demands of the shippers, the tonnage will increase almost by leaps and bounds. Mr. Lemon claimed that a survey was made some time ago by a captain of a Shipping Board vessel engaged in these trades and the information was presented to Washington, and he is following up the work already started, as he believes if the matter was properly called to the attention of the Board something will be done.

KRULL PROMOTED

H. T. Krull, who served as general agent for the Admiral Oriental Line in different ports in the Orient for four years, was recently appointed agent of the freight department of the company in Seattle, succeeding C. Ballard, who was promoted to the position of agent of the Admiral Oriental Line in Portland, Oregon. Mr. Krull was in the service of the old Pacific Coast Steamship Company, the Pacific Steamship Company, and the Admiral Oriental Line a total of twenty-seven years.

CAPTAIN HOLLAND TO SWEDEN

Captain C. J. Holland left San Francisco July 20 for Gothenburg, Sweden, where he will take command of the Pacific Mail Steamship Company's new motorship City of Panama. This is the second of the two new motorships built in Sweden for the Pacific Mail's San Francisco-Cristobal run. The other vessel, the City of San Francisco, will be commanded by Captain Curt Zastrow and will arrive on the Pacific Coast early in September.

SCOTT TO EUROPE

Harry S. Scott, president and general manager of the General Steamship Corporation, left San Francisco the first of July for a tour of the Atlantic seaboard and Europe. While away Mr. Scott expects to call on the various representatives of the different lines for which his company are agents on the Pacific Coast.

ORIENTAL

Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, Panama Canal and Los Angeles.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels.)
701-2 Transportation Bldg. Phone Tucker 3670.
FREIGHT ONLY.
SAILINGS—Regular intervals from Los Angeles and San Francisco, thence to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Darien, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
S. L. Kreider, agent.
375 Pacific Electric Bldg. Phone Tucker 4250.
PASSENGERS AND FREIGHT.
SAILINGS—Regular to Orient ports, Japan via San Francisco, connecting at Hongkong, West Coast of Mexico and South American ports.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

PORTLAND

AMERICAN ORIENTAL SERVICE

A. M. Gillespie, Jr., agent.
Board of Trade Bldg. Phone Broadway 4240.
SAILINGS—Monthly sailings to Japan, China and intermediate ports.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
702 Wilcox Building. Phone Main 4113.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NORTH CHINA LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Take Bar and Darien.

PORTLAND-ORIENT LINE

Walker & Company, agents.
Porter Building. Phone Bdwy. 5644.
SAILINGS—From Portland to Yokohama, Kobe, Shanghai, Taku Bar, Dairen, World wide.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
Oregon-Pacific Company, agents.
2084 Yeon Building. Phone Bdwy. 4829.
FREIGHT ONLY.
SAILINGS—Monthly from Portland to Orient ports.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

SOUTH CHINA LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Broadway 5644.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Portland to Yokohama, Kobe, Hongkong and Manila.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company.
1109 Porter Building.
FREIGHT ONLY.

SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Yokohama Building. Phone Seymour 8580.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Victoria, Vancouver to Yokohama, Hongkong, Manila.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Kent, Pacific Coast manager.
Pacific Steamship Bldg.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama and Shanghai, calling at Honolulu. Connecting with Line sailing via San Francisco for Australia and New Zealand ports.

CANADIAN PACIFIC STEAMSHIPS, LTD.

Canadian Pacific Railway Station, Main & Seymour Sts.
PASSENGERS AND FREIGHT.
SAILINGS—

DOLLAR STEAMSHIP LINE

Agents, Pacific Dollar Steamship Line.
402 Pender street, West. Phone Seymour 8580.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.

NIPPON YUSEN KAISHA

R. M. Gray & Co., agents.
602 Hastings street, West. Phone Seymour 8580.
PASSENGERS AND FREIGHT.
SAILINGS—

OSAKA SHOSEN KAISHA

Empire Shipping Company, Ltd.
815 Hastings street, West. Phone Seymour 5034.
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks from Vancouver to Japan and China ports. Victoria to Japan, Singapore, Penang.

SUZUKI & COMPANY

[illegible]
FREIGHT ONLY
SAILINGS—

WALKER-ROSS, INC.

[illegible]
FREIGHT ONLY.
SAILINGS—

YAMASHITA KISEN KOGYO KAISHA

[illegible]
FREIGHT ONLY.
SAILINGS—

UNITED KINGDOM---CONTINENTAL EUROPE

SAN FRANCISCO

BLUE FUNNEL LINE

Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.
2 Pine street. Phone Sutter 4-7.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Ltd.
418 [illegible]
PASSENGERS AND FREIGHT
SAILINGS—

ELLERMAN'S WILSON LINE, LTD.

Norton [illegible]
FREIGHT ONLY

LOS ANGELES OFFICE

The United States Lines have established an office in Los Angeles which will be under the management of Mose Hunt, well known in Pacific Coast shipping circles. Mr. Hunt was formerly assistant operating manager of the Pacific Mail Steamship Company at San Francisco, leaving that company in 1923 to join the Leviathan as chief purser.

TATJANA ABANDONED

Bids submitted for repair to the Norwegian freighter Tatjana, which went ashore on Village Island near Victoria, B. C., several weeks ago, were considered excessive by the marine underwriters and the vessel was abandoned to the Pacific Salvage Company, who plan to sell the vessel as she stands or repair her and endeavor to dispose of her at private sale.

The steamer Tatjana was built by Canadian Vickers, Montreal, four years ago. She is 400 feet long, 52 feet beam, and has a depth of 22.2 feet, and is of 8259 tons deadweight.

H. P. CHRISTIES

Shipping circles recently received word from Montrose, Scotland, of the death of Henry P. Christies, for years one of the foremost shipbuilding and marine engineering authorities of the Pacific Coast. Mr. Christies at one time lived in San Francisco and his passing is felt by scores of friends.

PORT MEET

The American Association of Port Authorities will hold its annual convention at Los Angeles, October 13 to 15. Headquarters will be at the Biltmore Hotel and an attendance of 300 is expected.

The annual convention of the Pacific Coast Association of Port Authorities is to be held at Seattle on September 3 and 4.

LAMME PASSES

Benjamin G. Lamme, chief engineer of the Westinghouse Electric & Manufacturing Company and one of the world's leading electrical authorities, passed away July 8 at his home in East Liberty, Pennsylvania, after several months' illness. Mr. Lamme was born on a farm in Ohio in 1864. He entered Ohio State University in 1887 and was graduated in 1890. He joined the Westinghouse Electric Company in 1889 at the princely salary of $50 a month. His career to his death is bespoken in the record of 150 patents in the electrical field which were granted to him individually.

UNITED KINGDOM---CONTINENTAL EUROPE

SAILINGS—Service between Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports, via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation, sub-agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
710 Balfour Building. Phone Sutter 6478-6479.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports when inducements offer.

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
351 California street. Phone Sutter 7437.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

ISTHMIAN STEAMSHIP LINES

E. C. Evans & Sons, agents.
260 California street. Phone Douglas 8040-1-2.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Co., general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, St. Kilda and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint service of the Royal Mail Steam Packet Company and Holland America Line.)
401 Market street. Phone Douglas 7710.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp, Hull.

NORWAY PACIFIC LINE

485 California street. Phone Sutter 5969.
FREIGHT ONLY.
SAILINGS—From San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavian ports as inducements offer.

PACIFIC EUROPEAN LINE

Parke Ashburn & Co., Pac. Coast agents.
110 California street. Phone Douglas 1672.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco and United Kingdom and Continental Europe.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
[illegible]
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Mediterranean ports. [illegible] inducements offer.

UNITED AMERICAN LINES, INC.

Stubbs & Chapman, Pac. Coast Agents.
230 California street. Phone Garfield 2446.
Pier [illegible], Seattle.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SEATTLE

BLUE FUNNEL LINE

Dodwell & Company, Ltd., agents.
Stuart Building. Phone Elliott 147.
PASSENGERS AND FREIGHT.

SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.
520 Alaska Building. Phone Elliott 9[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—Regular [illegible] Pacific Coast ports to [illegible], Hamburg, Copenhagen, [illegible] transshipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2480.
FREIGHT ONLY.
SAILINGS—Service between Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation, sub-agents.
Colman Building. Phone Elliott 5706.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

(Furness, Withy & Company, Ltd.)
Furness (Pacific), Ltd.
[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 5706.
SAILINGS—From Pacific Coast ports to London, Hull, Leith also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company, agents.
Stuart Building. Phone Elliott 1244.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer. From August to December, sailings every 2 weeks.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company.
Alaska Building. Phone Elliott 2480.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Co., agents.
Hoge Building. Phone Elliott 3412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, St. Kilda and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint service of the Royal Mail Steam Packet Company and Holland America Line.)
204-206 Hoge Building. Phone Elliott 4544.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp, Hull.

PACIFIC EUROPEAN LINE

[illegible]
FREIGHT ONLY.
SAILINGS—[illegible]

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

[illegible]
FREIGHT ONLY.
SAILINGS—[illegible] Mar[illegible]

UNITED AMERICAN LINES, INC.

[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe. [illegible]

CHARTER PARTY

Pacific Steamship Company's steamer Ruth Alexander sails from San Francisco September 17 for Los Angeles under charter to carry 300 members of San Francisco Lodge No. 3, B. P. O. E., who will attend the state conclave at Avalon. Many novel accommodation features are being arranged, traditional Admiral Line service prevailing.

D. G. COOKE

General Steamship Corporation on August 1 opens an office in Los Angeles under charge of Daniel G. Cooke. The General Steamship Corporation on that date takes over the agency in Los Angeles territory of the Garland Line intercoastal service, which was previously handled by S. L. Kreider.

BARON ITO—N. Y. K.

Addressing the stockholders of the Nippon Yusen Kaisha at the semi-annual meeting in Tokio, at which a dividend of 10 per cent was declared, 1,500,000 yen being drawn from reserve for this purpose, Baron Y. Ito, president of the company, expressed the belief that rock bottom had been reached in the depression in shipping during the past year. Although no decided improvement was discernible thus far, he added, no tendency for the worse was noticeable, such as had been the case continuously for the past few years. As far as the Nippon Yusen Kaisha was concerned, he said, the result of operations during the term under review showed an appreciable improvement, due in a great measure to the augmentation of freight earnings upon the increased importation of materials for reconstruction and other necessaries. Thus the net profit amounted to 1,600,000 yen as against 1,100,000 for the previous term. In order to cover the heavy loss suffered by the firm through the earthquake, amounting to more than six million yen, and the necessary addition to the pension fund of four million yen, he recommended that the 5,101,000 yen be diverted from the excess insurance fund, 2,000,000 yen from the mercantile marine schools fund, and 3,000,000 yen from the fund for construction and repair of office buildings. Touching the difficulty of forecasting the lifting of the shipping depression, Baron Ito emphasized the unsettled condition, political and financial, still prevailing in Europe, despite the frequently rumored dawn of returning normalcy, and he deplored what he termed the seemingly ingrained anti-alien policy of America.

UNITED KINGDOM---CONTINENTAL EUROPE

LOS ANGELES

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company.)
Dodwell & Company, Ltd.
412 Union Oil Building. Phone Broadway 7900 and Vanduke 4944
FREIGHT ONLY.
SAILINGS—Every 6 weeks from North Pacific Coast ports, including San Francisco and Los Angeles to London, Liverpool and Glasgow via Panama Canal.

EAST ASIATIC COMPANY, LTD.
Balfour, Guthrie & Company, agents.
315 Union Oil Bldg. Phone TRinity 3144.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Havre, Gothenburg, Copenhagen, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
926 Van Nuys Bldg. Phone TRinity 3144.
FREIGHT ONLY.
SAILINGS—Steamers from Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
S. L. Kreider, agent.
375 Pacific Electric Bldg. Phone TRinity 6550.
FREIGHT ONLY.
SAILINGS—From one a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness Withy & Company, Ltd.)
Swayne & Hoyt, Inc.
488 Pacific Electric Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco, Los Angeles to Manchester, Glasgow, Liverpool, London, Hull and other United Kingdom ports as inducements offer.

GENERAL STEAMSHIP CORP.
S. L. Kreider, agent.
Pacific Electric Bldg. Phone Pac. 0000 Bdwy. 23.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
315 Union Oil Building. Phone 7665
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
926 Van Nuys Bldg. Phone TRinity 3144.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
H. R. & M. E. McLaurin, Inc.
406 South Main street. Phone Main 4800
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Hamburg-American Line and Royal Mail Steam Packet Co.)
C. J. Lehman, agent.
123 E. South street. Phone Tuxedo 5171.
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, Astoria, San Francisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

NORWAY PACIFIC LINE
203 Palos Verdes street, San Pedro.
FREIGHT ONLY.
SAILINGS—Four motorships operating from San Francisco and Los Angeles to United Kingdom Continental ports and Scandinavia. Sailings every 30 days.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
926 Van Nuys Bldg. Phone TRinity 3144.
FREIGHT ONLY.
SAILINGS—Steamers from Vancouver, Seattle, Portland, San Francisco and Los Angeles to Marseilles, Havre, Antwerp and London.

UNITED AMERICAN LINES, INC.
Los Angeles S. S. Co., general agents.
[illegible]
PASSENGERS AND FREIGHT
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

PORTLAND

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company.)
[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, including San Francisco and Los Angeles to London, Liverpool and Glasgow via Panama Canal.

EAST ASIATIC COMPANY, LTD.
Chairner & Company, general agents.
Porter Building. Phone Broadway 4151.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Havre, Gothenburg, Copenhagen, with transshipment at all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Steamers from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
(General Steamship Corporation, agents.)
[illegible]
FREIGHT ONLY.
SAILINGS—To [illegible]
Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Furness Building.
[illegible]
PASSENGERS AND FREIGHT
SAILINGS—From [illegible] Vancouver, Seattle, San Francisco, Los Angeles, San Diego to Manchester, Glasgow, Liverpool, London, Hull and other United Kingdom ports as inducements offer.

GENERAL STEAMSHIP CORP.
[illegible]
FREIGHT ONLY
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
[illegible]
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
[illegible]
FREIGHT ONLY
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles, San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
[illegible]
PASSENGERS AND FREIGHT
SAILINGS
[illegible]

NORTH PACIFIC COAST LINE
(Joint service of the Hamburg-American Line and Royal Mail Steam Packet Co.)
[illegible]
PASSENGERS AND FREIGHT
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, Astoria, San Francisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

SAFETY AT SEA

W. C. Edwards, head of the Self Bailing Life Boat Company, headquarters Seattle, announces that a contract for a 24-foot self-bailing boat will soon be let to the Puget Sound Sheet Metal Works. The boat is designed to replace ordinary lifeboats and complies with all government regulations. Among its interesting features are three air compartments, in a double bottom, the air being located in separate tanks in the ends and under the seats. Four valves in the bottom of the boat automatically expel any water which comes over the side, and at the same time do not allow water to come up through the bottom. This improved boat, which in appearance closely resembles the standard boat, when loaded with 8550 deadweight pounds and filled with water, will bail itself dry in 20 to 24 seconds. The Self Bailing Life Boat Company plans to begin production on a large scale within a short time.

ISTHMIAN LINE

The Isthmian Line, through Norton, Lilly & Company, soon will make Charleston, South Carolina, a port of call in its Far Eastern service. Monthly sailings from New York to the ports of Dairen, Shanghai, Kobe, Yokohama, and Hongkong are planned. The Carolina Company will act as agents for the new service at Charleston. Cotton and cotton piece goods will make up the bulk of the initial shipment outbound and much interest is being displayed by the textile houses of southeastern milling points.

ROUND-THE-WORLD

SAN FRANCISCO

DOLLAR STEAMSHIP LINE
[illegible]
Robert Dollar Co., [illegible] California street
[illegible]
PASSENGERS AND FREIGHT.
SAILINGS [illegible]
[illegible]
FREIGHT ONLY
REGULAR SAILINGS [illegible]
[illegible]

LOS ANGELES

DOLLAR STEAMSHIP LINE
[illegible]
PASSENGERS AND FREIGHT
SAILINGS
[illegible]
FREIGHT ONLY
REGULAR SAILINGS
[illegible]

UNITED KINGDOM---CONTINENTAL EUROPE

cisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

PACIFIC EUROPEAN LINE
Statter & Johnstone, agents.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco and United Kingdom and Continental Europe.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—From Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer

UNITED AMERICAN LINES, INC.
Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Broadway 5360.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service.
Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

VANCOUVER

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., agents.
Yorkshire Building. Seymour 9576.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keely, Pacific Coast manager.
Phone Seymour 2429.
FREIGHT ONLY.
SAILINGS—Monthly to Avonmouth via Panama.

EAST ASIATIC COMPANY, LTD.
B. L. Johnson, Walker & Company, agents.
837 Hastings street, West. Phone Seymour 7147.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN'S WILSON LINE
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Hasty, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports subject to consent of Hull.

FRENCH LINE
Compagnie Generale Transatlantique.)
Empire Shipping Co., Ltd. Phone Seymour 8014
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver to Bordeaux, Havre, Antwerp and Hamburg.

FURNESS LINE
Furness Withy & Company, Ltd.
Furness (Pacific), Ltd.
1312 Standard Bank Building
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Vancouver and other Pacific Coast ports to United Kingdom.

GENERAL STEAMSHIP CORP.
Empire Shipping Co., Ltd., 818 Hastings St., W.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—From Pacific Coast ports to United Kingdom and Scandinavia, as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company, Ltd.
Phone Seymour 6680.
FREIGHT ONLY.
SAILINGS—Sailings every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December fortnightly.

ISTHMIAN STEAMSHIP LINES
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
SAILINGS—Intercoastal Service.
SAILINGS—Pacific-United Kingdom Service.
Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
C. Gardner Johnson & Company, Ltd.
Metropolitan Building. Phone Seymour 357.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm and Helsingfors

NORTH PACIFIC COAST LINE
(Joint service of The Royal Mail Steam Packet Co. and Holland America Line
Royal Mail Steam Packet Company, agents.
Pacific Building. Phone Seymour 7108.
PASSENGERS AND FREIGHT.
SAILINGS—Regular services between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles and Liverpool, Glasgow, Antwerp and Hamburg

PACIFIC EUROPEAN LINE
Canadian American Shipping Co., agents.
FREIGHT ONLY.
SAILINGS—Monthly between Vancouver, Seattle, Portland, San Francisco and United Kingdom and Continental Europe.

Mexico---Central America--Canal Zone---South America

SAN FRANCISCO

GENERAL STEAMSHIP CORP.
240 Battery street. Phone Kearny 4100.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE
W. R. Grace & Company, general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports of Peru and Chile as inducements offer.

LATIN-AMERICA LINE
R. S. Sayre & Company, general agents.
140 Montgomery street. Phone Sutter 5712
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Portland, Seattle and San Francisco to all ports on West Coast of Mexico and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Portland, Seattle and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

McCORMICK STEAMSHIP CO.
215 Market street
PASSENGERS AND FREIGHT.
SAILINGS—Every three weeks from San Francisco to San Jose del Cabo, La Paz, Guaymas, Topolobampo, Mazatlan, San Blas and Manzanillo.

MEXICAN FREE PORTS S. S. LINE
Williams, Dimond & Company, Agents.
310 Sansome St. Phone Sutter 2460.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to the West Coast of Mexico.

MEXICAN STATES LINE
Williams, Dimond & Company.
310 Sansome street. Phone Sutter 2460.
PASSENGERS AND FREIGHT.
SAILINGS—Every 8 days from San Francisco and Los Angeles to West Coast of Mexico and Central America.

PACIFIC LINE
The Pacific Steam Navigation Company.
550 Market street. Phone Sutter 4032
PASSENGERS AND FREIGHT.
SAILINGS—Regular via Panama Canal, Guaymas, Callao, Mollendo, Arica, Iquique, Antofagasta, Valparaiso, Talcahuano, Corontel, also to Havana and New York; also via Cristobal to Havana to Spain, France and England. Steamers connect at Panama for North Pacific Coast ports.

PAC.-ARGENTINE-BRAZIL LINE
(Operating U. S. S. B vessels.)
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight.
Twice a month between San Francisco, Los Angeles, calling at ports on West Coast of Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, and Taltal. (Other ports as inducements offer.)

TOYO KISEN KAISHA
(Oriental Steamship Company.)
549-51 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via Honolulu.

SEATTLE

GENERAL STEAMSHIP CORP.
Colman Building. Phone Elliott 5706.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE
W. R. Grace & Company, agents.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports of Peru and Chile as inducements offer.

LATIN AMERICA LINE
Lea Mathews Shipping Corporation.
Alaska Building. Phone Elliott 4567.
FREIGHT ONLY.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Seattle, Portland and San Francisco to all ports on West Coast of Mexico, and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Seattle, Portland and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

PAC.-ARGENTINE-BRAZIL LINE
(Operating U. S. S. B vessels.)
Swayne & Hoyt, Inc., managers.
Lobby No. 4, Central Bldg., Phone Elliott 6383
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PAN-PACIFIC LINE
Norton, Lilly & Company, general agents.
Vance Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta and Taltal. (Other ports as inducements offer.)

LOS ANGELES

GENERAL STEAMSHIP CORP.
S. I. Kreider
325 Pacific Electric Bldg. Phone TRinity 6556.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE
H. R. & M. F. McLaurin, Inc.
606 South Main street. Phone Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports in Peru and Chile as inducements offer.

MEXICAN FREE PORTS S.S. LINE
Wheaton & Krueger. 621 Charman Building.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to West Coast of Mexico.

MEXICAN STATES LINE
Wheaton & Krueger.
621 Charman Building
PASSENGERS AND FREIGHT.

FREIGHTS AND CHARTERS

July 17, 1924.

SINCE our report dated June 16, liner space on grain from this coast to the United Kingdom and Continent has declined from 32/6 to 27 6. then to 25/- and finally some small lots were booked at as low as 20/-. In full cargo fixtures, the British stmr. Fall City was closed by Kerr, Gifford & Co. for August loading at 31 3 for wheat from the North Pacific to the United Kingdom or Continent and the same charterers took British stmr. Callandia for the same business and at the same rate of freight for July-August. British stmr. Benavon is also reported fixed for the same business at the same rate for August loading.

For lumber for Australia, the Japanese stmr. Hokkoh Maru has been chartered by W. L. Comyn & Co. from the North Pacific to two ports Australia at $12.50 for August loading and the same charterers are sending their barktn. Anne Comyn with lumber from the North Pacific to Melbourne, terms private. Also to be used in the lumber trade for Australia, J. J. Moore & Co. have taken Norwegian stmr. Rigi on time charter for one round trip, delivery Australia, redelivery Australia, via North Pacific, at 3 - per deadweight ton per month, and A. M. Gillespie & Co. have chartered the Norwegian stmr. Niels Nielsen, delivery North Pacific, redelivery Australia, one trip, at $1.25 per deadweight ton per month, and Balfour, Guthrie & Co. have taken Norwegian stmr. Luise Nielsen for the same business at the same rate of freight.

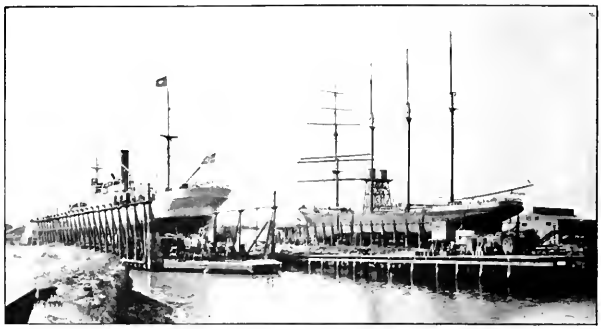
Mitsui & Co. have put in one of their steamers for lumber for Newchang at a reported rate of $9.50. British stmr. Havenside is fixed for lumber from the North Pacific to Cuba, terms private.

American m.s. Frank Lynch has been taken for lumber from the North Pacific to New York at $13.50 by Jayne, Yearance Lumber Co. Norwegian stmr. Thordis was also fixed for lumber from British Columbia to North of Hatteras at $12.50, July-August.

For coal from Norfolk for government account, stmr. Commercial Traveler is fixed for Tiburon, Cal., at $2.58 per ton; stmr. Pomona for Tiburon at $2.25; stmr. Hamilton F. McCormick for San Diego at $2.47; stmr. Orient for Tiburon at $2.18; all free of stevedoring.

American bktn. Phyllis Comyn was fixed for nitrate from Chile to Honolulu at a rate of $4.50 by W. R. Grace & Co.

British stmr. Nile is reported sold to M. Berardini of Los Angeles at $100,000. PAGE BROTHERS,
Brokers.



Marine Railways at the Alameda plant of the General Engineering Company.

Shipping Notes

R. M. S. P., LONDON

Royal Mail Steam Packet Company, at their annual meeting in London recently, found that their offices in Moorgate, which they have occupied for eighty-five years, had become too small and Lord Kylsant, chairman of the board of directors, announced that the firm had purchased a site one and a half acres in extent, the former site of the great East India Company, founded in 1600. Half of the property acquired will house the new offices of the Royal Mail Steam Packet Company and the other half was sold to the Corporation of Lloyd's for their new exchange. There are few spots in the city of London which are richer in historical associations than the area on which stood the old East India House. The house was the resort of all the great soldiers who served in the company from Clive to the Duke of Wellington, and all governors-general from Warren Hastings to Dalhouse and Canning. The magnificent site will in future be the home of not only the oldest ocean chartered company, incorporated by royal charter in 1839, but also of the famous Corporation of Lloyd's, which for two centuries has been closely connected with British shipping. Lord Kylsant, in his annual report, declared that Canada with her unoccupied lands and incalculable resources offers magnificent prospects to the intending settler from Europe. The Royal Mail Steam Packet Company has close ties with the great dominion by reason of its Canada-West Indies services, its trans-Atlantic passenger services to Canada's eastern ports and its important freight and passenger lines to and from the North Pacific ports of Canada. As to general prospects, Lord Kylsant said: "Looking to the future, I feel on the whole there is reason for a moderate optimism as regards British shipping, but there are some big and difficult problems before us. One of these is what is the best and most economical means of ship propulsion. Immense strides have been made in recent years in the propelling machinery for ships, involving practically a revolution in marine engine construction. The motor engine has many advantages in the economy of fuel, saving of space, cleanliness, etc., but it is still more costly to build than the steam engine. I believe that the motorship has come to stay."

PORT HEAD

George F. Cottrell has been elected president of the Seattle Port Commission, succeeding Colonel George Lamping, retiring president. Colonel Lamping remains a member of the body. W. S. Lincoln was appointed secretary.

MARINE EQUIPMENT SECTON

(Continued from Page 427)

no great slewing stress carried through the revolving frame.

The crane has two traveling speeds, and reversal of direction is accomplished by reversing the engine. Steering while propelling is accurately accomplished from the operator's platform through friction clutches and brakes controlling each tractor belt. Either belt may drive, coast, or be held by brake in any degree to negotiate as sharp or wide a turn as desired. This propelling and steering mechanism is one of the exclusive features of this type "D" crane. It enables the operator to propel and steer the crane independently of all other motions with the boom in any direction. It is especially powerful, enabling the crane to travel up steep grades and over rough ground. Propelling up an incline skidway onto a flat car for transportation is very easily done. Other exclusive features are the automatic double hoisting drums, which provide automatic control of the bucket during operation. Both drums provide enough rope pull as required for dragline and hoisting purposes. The feature of hoisting the bucket open on the auxiliary drum greatly increases the output of the crane and makes operation much simpler. A radius varying appliance consisting of bronze worm, worm wheel, and drum and controlled by friction clutches and semi-automatic brake raises or lowers the boom when loaded to its maximum capacity. Levers actuating all motions are conveniently placed in two rows in front and alongside of the operator's platform, which is located on the right-hand side with a full view of the work being done.

The new industrial is built for either steam, electric, or gasoline power. The crane is extremely versatile, operating with clamshell or dragline bucket, electro-magnet, hook and block, or grapple. It is readily convertible into a shovel or a pile driver. The makers are confident that their new crane will supply a edmand for a general utility crane of small capacity sturdily built. It should find a ready market in practically all fields of industry.

"Origin, Development, Results of Elesco" is the subject of a booklet which is published by the Superheater Company of New York and Chicago, manufacturers of Elesco superheaters. It gives in brief form the history of the Superheater Company and the growth of its operations up to the present time, when it occupies the unique position of manufacturers of superheaters for every type of steam boiler in locomotive, marine and stationary services. The development of the use of high degree superheated steam is traced from the earliest experiments of the late Dr. Wilhelm Schmidt of Cassel, Germany, to the present tendencies in steam generation in this country. An interesting paragraph is the one that explains the origin of the trade name Elesco applied to the products of that company.

A copy of this book will be sent to anyone mentioning this publication.

The above three illustrations show the character of the installation of the Sterling gasoline driven pump installed by A. G. Hebgen Company of Clear Lake, California. The results of the tests on this installation were described in Pacific Marine Review for July. Note the full steady stream at the tank outlet shown in the upper center.

SEATTLE WATERFRONT ORGANIZATION
(Continued from Page 408)

3. The development of statistical information has based decisions on fact and reason instead of opinion and emotion.

4. Employers and employes, through their regular and frequent contact in committees, develop a mutual respect and forbearance.

5. Pilferage is reduced.

6. More important than the foregoing—men's earnings have been increased without adding to the ship's expense.

This particular development of decasualization resulted from the elimination of the unnecessary men, the compilation of figures showing each man's actual earnings and the equalization of earnings through the aid of these figures. It is unlikely that there is any other port in the world where such definite information is obtainable. Most wage disputes center around the hourly rate; on the Seattle waterfront that has become of less importance than the monthly earnings.

The comparative results observed since the adoption of the Join Organization Plan are surprising. The average monthly earnings show that in January, 1921, the point of greatest surplus of men, the longshoremen earned only $58 and the dock workers $40. These earnings steadily increased as the decasualization proceeded. Since August, 1921, by which time the surplus of men was eliminated, the earnings for the past two and a half years have averaged for all longshoremen from $140 to $175 and for all dock workers from $100 to $135 per month.

Costs

A natural question is, "What does it cost to carry on all these services of central dispatching, paying, a convenient and comfortable hall, and the committee work?" The cost of breaking up a single severe struggle such as the four months' strike of 1916 would pay all of the expenses of the present peace program for ten years.

So far the general result of cooperation through Joint Organization and the consequent decasualization has been to develop a growing good will and understanding, to promote orderly and efficient operation, to improve conditions of the workmen, to provide joint committee machinery for adjusting grievances, and, most valuable to employes, employers and the community alike, to stabilize the industry.

Although the foregoing cooperative plan with its effort to regularize longshore work may perhaps be uncommon in waterfront experience, progressive manufacturing plants to the number of nearly a thousand have applied the same underlying principles with success. Those principles may be summarized as follows:

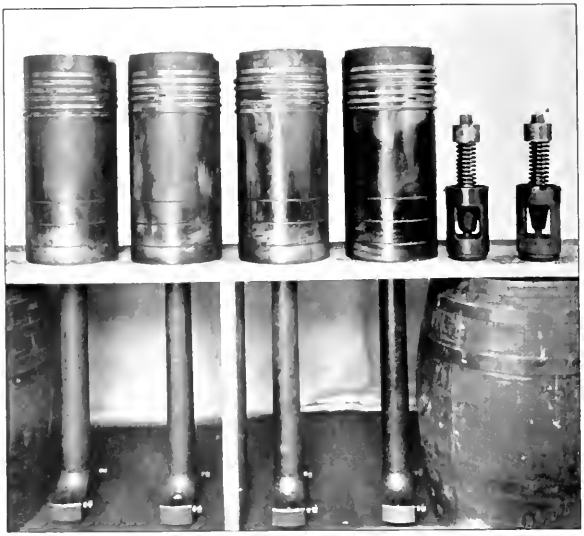
First, management must voluntarily assume responsibility for improving the conditions of the men.

In the second place, cooperation in production between men and management is indispensable. Lest there be doubt concerning the spirit of the workingman, it is well-founded experience that employes respond to considerate management.

PETRIE T. AND G. PISTON RINGS

THE Petrie tongue and groove piston ring is a patented two-piece ring. The lower piece carries the groove into which the tongue of the upper piece seats itself. By this construction the lower piece has a spring as well as a sealing ring. The upper piece is purely a sealing ring. Both pieces must wear together, as the tension produced by the lower piece is transmitted to the upper piece through the tongue and groove. The lower piece by its construction, shaped like the letter "L", gives a uniform strength which cannot be disturbed by unequal stresses. Thus the proper spring tension is automatically obtained and is of such quantity as to seal the gases in the combustion chamber. In this way the excessive wear due to piston ring friction is reduced to a minimum.

The rings are made of a special grade of cast iron, individually cast, of very fine granular structure, elastic but not too hard. This material has been carefully selected in order that the rings will preserve their elasticity and their gas sealing qualities when subjected to the high heat stresses and is not hard enough to wear the cylinder walls.



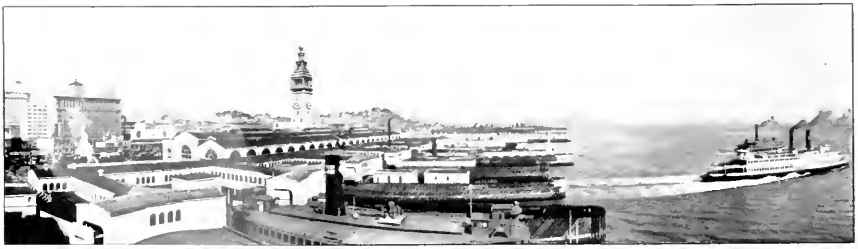
At the plant of the National Ice & Cold Storage Company, San Francisco, a test was conducted on a 200 horsepower four-cylinder Dow Pump & Diesel Engine Company engine, featuring several types of piston rings and their effect on the cylinder walls. The cylinder in which the Petrie rings were installed showed a beautiful high gloss of uniform reflecting quality. Careful micrometer data failed to show any inequality in cylinder wear. A darker surface marked the limit of the upper piston ring travel, but no ridge was formed, proving the absence of cylinder wear. The illustration herewith shows the pistons and two valve cages after twenty-seven months' constant use under heavy overload conditions.

In the engine room of the plant of the National Ice & Cold Storage Company, where the demonstration occurred, there was no evidence of gas leaks generally manifested by the blackened appearance of ceilings and walls. A reduction of lubricating oil of from eighteen to twenty per cent was recorded.

A group of engineers and diesel engine manufacturers were called to witness the drawing of the pistons from the engine at the National Ice & Cold Storage Company and observe the results. They gave particular attention to the condition of the rings and cylinder walls. Their expressed opinion was that the method of conducting the test was correct and the results obtained especially satisfactory.

These rings have been installed on motorships where as high as 27 per cent to 40 per cent reduction in lubricating oils have been recorded. On automobiles the saving on gasoline and oil has been very material and the compression increased materially.

The diesel marine engines of the Standard Oil Company equipped with the Petrie tongue and groove piston rings have given satisfactory results for economy and increased compression. The engines are now operating to full load capacity and designer's speed requirements. The motorship Charlie Watson and the motorship H. T. Harper have now been equipped with Petrie rings for more than one year.



Pacific Marine Review

The National Magazine of Shipping

SEPTEMBER, 1924

Official Organ PACIFIC AMERICAN STEAMSHIP ASSOCIATION

Official Organ SHIPOWNERS' ASSOCIATION OF THE PACIFIC COAST

Pacific Marine Review, Vol. [illegible] No. 9. Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3. 1879. $2.00 a year.

Why McGraw carries 25 men

NINE MEN are all that can play at any one time. The rest are insurance. A player may be injured—McGraw has a reserve supply. The turn of the game may require a pinch hitter—McGraw calls on the bench. It is this knowledge of his reserve forces that enables McGraw to play a winning game.

Oxygen for your day's needs is all that is necessary to run your plant. Your Linde contract is insurance. One oxygen plant may break down—Linde has a reserve supply. An increase in your business may require an excess of oxygen—Linde calls on any or all of its 115 plants and warehouses. It is this knowledge of Linde's reserve forces that enables you to be free from worry over oxygen—if you are a Linde customer.

Linde uses its team

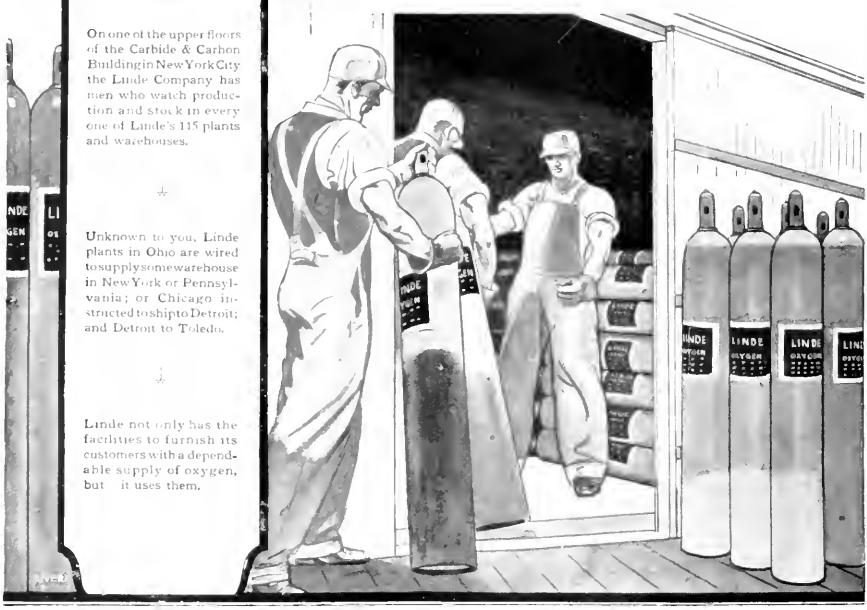
The Linde team of 115 plants and warehouses would be of little advantage to you if Linde did not play the game and use these plants and warehouses for you.

On one of the upper floors of the Carbide & Carbon Building in New York City the Linde Company has men who watch production and stock in every one of Linde's 115 plants and warehouses.

Unknown to you, Linde plants in Ohio are wired to supply some warehouse in New York or Pennsylvania; or Chicago instructed to ship to Detroit; and Detroit to Toledo.

Linde not only has the facilities to furnish its customers with a dependable supply of oxygen, but it uses them.

THE LINDE AIR PRODUCTS COMPANY
General Offices: Carbide & Carbon Bldg.
30 East 42d Street, New York
38 PLANTS—77 WAREHOUSES



LINDE OXYGEN

YOU CAN DEPEND ON THE LINDE COMPANY

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SEPTEMBER, 1924

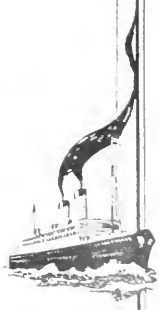


Photo by Lange

THE FAMOUS BULL DOG OF THE NAVY

U. S. B. S. Oregon on her trials in San Francisco Bay July, 1896. The first battleship built on the Pacific Coast, her record established western shipbuilding ability.

SEPTEMBER, 1924 Vol. XXI. No 9

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

339 AT 30 CHURCH STREET, NEW YORK

James S. Hines, President and Publisher.

Bernard N. De Rochie, Vice-Pres. and Manager.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1924, by J. S. Hines.
Published on the 25th of each month preceding the publication date.
Advertising and editorial forms close on the 20th.
Subscription price, a year: domestic, $2; foreign, $3; single copies, 25c.

Alexander J. Dickie, Editor.

Paul Faulkner, Advertising Manager.

THE SHIPOWNERS' ASSOCIATIONS VERSUS THE SAILORS' UNION

THE Sailors' Union of the Pacific was born, according to its own account, on the 5th of March, 1885. Two years later, in June, the Shipowners' Association of the Pacific Coast came into being. In forty years much "water has come and gone under the dock" and Pacific Marine Review, as official organ of the Shipowners' Association of the Pacific Coast, has often thought that a properly balanced account of the happenings of those years would be of great value.

Before presenting such an account we would have preferred to wait until world shipping should become more nearly normal, or at least until we could get a greater perspective on the hectic days of Shipping Board control.

Now, however, comes an Instructor of Economics of the University of California with a book of 185 pages, in which he tells the story of these years entirely from the viewpoint of the Sailors' Union of the Pacific and with a very adroit concealment of fact, at the same time alleging in his preface that he has had assistance from the Shipowners' Association, from Pacific Marine Review, and from the editor thereof.

In view of the attention which this book has received, we now propose in a series of articles to show that the facts are at wide variance from the statements in the book and to prove:

First, that the methods and propaganda used by the Sailors' Union under the leadership of Andrew Furuseth are subversive of respect for law, have been the principal factors in drawing I. W. W. into the Sailors' Union itself, and are transforming the "tragic lonely figure of the Norse Viking of the Pacific" into that of the most dangerous demagogue in America.

Second, that the brutality and slave conditions on American ships of the last generation were not the rule, but the exception; that their suppression and disappearance on American ships were due to many influences and would have been assured by this time practically without the assistance of the Sailors' Union; indeed, were due as much to the work of the Shipowners' Association as to that of the Union.

Third, that the seeming success of this propaganda, as broadcasted by instructors in the Departments of Economics in our Universities, is undermining respect for law and for contract among the youth of America, and is creating a very false and harmful basis for economics in American business.

Fourth, that American sailors on the Pacific are now, through the intelligently applied cooperative efforts of the shipowners and the ship workers,

Better fed,
Better housed,
Better paid,

More independent than they could hope to be under Union control, and that a return to Union control would delay progress along these lines.

FALSE PROPAGANDA

"The account given is based principally on first hand sources, in particular on the official records or publications of . . . Shipowners' Associations."

"In preparation of the volume I have received ready and valuable assistance from many quarters. . . In particular I am indebted to . . . A. J. Dickie, editor of the Pacific Marine Review, who read my manuscript and gave many helpful criticisms."

These statements appear in the preface of the book, "The Sailors Union of the Pacific," by Paul S. Taylor, recently published by The Ronald Press of New York.

In substance and in implication these statements are both absolutely false.

In the opinion of men who have been intimately acquainted with the details of Pacific Coast shipping for two generations this book, "The Sailors' Union of the Pacific," bears unmistakable evidence that it is based on and is a part of the false propaganda prepared under the direction of Andrew Furuseth and published with the backing of the Sailors' Union of the Pacific.

The present series of articles published in Pacific Marine Review and in pamphlet form is edited and approved by the Shipowners' Association of the Pacific Coast and the Pacific American Steamship Association, the purpose being to make known the facts—to meet error with truth.

A Brief Introductory Survey of Some Errors Contained in "The Sailors' Union of the Pacific"

This book, entitled "The Sailors' Union of the Pacific," was very recently published by The Ronald

Press of New York. Written by Paul S. Taylor, Ph.D., Instructor of Economics at the University of California, it sets forth the "history" of the Sailors' Union of the Pacific. It is an excellent example of the propagandic variety of historic research. Its pages fairly bristle with specious half-truths, false premises, and unwarranted conclusions.

Title Deceptive

The title page is deceptive. The degree of Doctor of Philosophy was obtained after the completion of the manuscript of the book as a thesis.

Preface Misleading

The preface is an astounding piece of nerve showing the fine Italian hand of "the old man of the seas," (who, by the way, has not been to sea for thirty-five years). The second paragraph of the preface reads, "When the Coast Seamen's Union was founded in San Francisco less than forty years ago, the American merchant sailor in port was helpless in the hands of crimps," etc. The third paragraph recites that "This book sets forth the history of the organization whose efforts have undoubtedly been chiefly responsible for ending these conditions so far as the United States is concerned."

As these two statements contain the gist of the error in the argument broadcasted by this book and announce the conclusion to which the author comes at the close of this argument, it will be profitable to examine them in the light of the text of the book and of certain facts not included in the text.

Crimp—Boarding House System

Just what was the legal status of the merchant marine at that time? From page 30 of this book we learn that "the Shipping Commissioners' Act of 1872 struck at shanghaiing," and on page 31 that "the Dingley Act of 1884 was passed, which struck at the roots of the system upon which crimping flourished," and on page 30 again that "in 1879 San Francisco shipowners passed a resolution against paying blood money (crimps' revenue)."

Thus it will be seen that prior to the establishment of the Coast Seamen's Union an earnest effort was being made by shipowners and by legislators to break the power of the crimp boarding house system. In view of this fact is it not rather surprising that the Union, said to be formed mainly with the idea of improving the legal status of the seamen and getting him out of the power of the crimps, should in 1885 write into its constitution the clause "that no owner should ever be allowed to attend or join the Union?" Perhaps that clause explains why this Union, which on "July 1, 1885 (page 49), claimed two-thirds of the coasting sailors and a large proportion of the offshore seamen" as members, should have so hampered the shipping of crews that (page 32) "the Act of June 19, 1886, was passed—in effect a reestablishment of the advance system for the benefit of the crimps."

Shipowners' Association

While this latter legislation was pending at Washington there was founded in San Francisco on June 7, 1886, the Shipowners' Association of the Pacific Coast, which, according to Doctor Taylor's book, was an event "more disastrous for the seamen than the loss of their wages." That statement of the philosophical doctor stands blandly at the top of page 52 and is unsupported by any proof.

Owners Control

The facts today are that the Shipowners' Association of the Pacific Coast is in complete control of Pacific coastal shipping and that its work on behalf of the merchant seamen in its employ is of more economic benefit to those seamen than the former work of the Coast Seamen's Union or the present work of the Sailors' Union of the Pacific. Both union and non-union seamen are employed on equal terms, the continuous discharge book system is in beneficial operation, the men are serviced at their own charges and under their own supervision with reading and recreational rooms ashore, and at a cost considerably less than union dues. In addition they have better food, more commodious quarters, better arrangement for overtime, more prompt attention to grievances, more liberal adjustment of wreck losses, and more regular employment than they ever did or ever can have under Sailors' Union control.

The book "Sailors' Union of the Pacific" dismisses all these facts, which must have come under the author's observation, with the statement (page 142) that the owners' associations established "a shipping office commonly known among seamen as the 'slave market'" and reintroduced "the grade book system." Again (page 162) we find this: "With few exceptions the policy of the owners has been to concede as little as possible in time of prosperity and to slash wages ruthlessly in time of depression." And again (page 142), "wages began to move upward during the latter part of 1922 and the first part of 1923. But the owners' control of shipping remained." That "but" is a very eloquent word and it is significant that it is never used by by Doctor Taylor in connection with the fact that wages moved downward usually in times of union control.

Methods of Sailors' Union

Returning to the preface, mark this sentence: "The principles and methods followed by the sailors, in steering their organization in sagacious and moderate courses in spite of the opposition not only of the shipowners but of such radical elements as the I. W. W., well merit examination by students of organization and management."

Economic Failure

Keeping this thought in mind, we return to the text of "The Sailors' Union of the Pacific," as it bears on sagacity and moderation in action. We read (page 51) that the "one important question" in the beginning was "the bread and butter question"; and that in 1886 the Union demanded and maintained a basic rate of $35 per month, having at that time a membership of "2200 out of the 3000-3500 coast seamen." During the next twelve years they had so managed their affairs that, although in the meantime (1891, page 62) an amalgamation with the steamship men gave the sailors "3500-4000 members in good standing and a treasury of over $50,000," by 1898 (page 73) the treasury had dwindled to below $4000 and the membership below 1000, wages were lower than in

1886 and the Union had no control of the situation. This was the result of some thirteen strikes whose conduct was marked by sabotage, violence, and even murder, and which cost the treasury of the Union hundreds of thousands of dollars, and the individual members of the Union millions of dollars in wages. If this sort of sagacity and moderation in management is to be held up as an ideal by departments of economics in our universities, it might be well to get a new definition of economy.

This phase of Sailors' Union activity, classed as "Industrial" by the author, is acknowledged by him in the text, to have failed but the blame in every case is placed on the shipowner (page 105) who "regarded the strikes as unwarranted interference on the part of Andrew Furuseth of the Sailors' Union to dictate to them how they shall run their vessels."

Political Unwisdom

The abject economic failure is glossed over by an account of the so-called "political triumphs" of the Union through the work of Andrew Furuseth at Washington. That is a long story whose details will have to be treated in another chapter.

In brief, the picture is this. The political work of the Sailors' Union of the Pacific has, by a series of bills culminating in the Seamen's Act of 1915, made the sailor a "free man" in the United States. The Sailors' Union historian frankly declares that (page 118) this "freedom is not the end, it is the means. The Seamen's Act is not the goal, but the weapon. It is not a roasted goose, it is the gun with which to shoot the goose."

Many shipowners of America have felt and still feel that the Seamen's Act, if enforced in all its provisions, would drive the American merchant marine out of foreign trade. In fact, the privately owned American merchant marine is practically out of the overseas general foreign trade at the present time, and in the trans-Pacific trade there is not one privately-owned American vessel.

The "goose" that once laid "golden eggs" may already have been fatally wounded. If so, one fails to see where there is any political triumph for the Sailors' Union of the Pacific, who by turning their freedom into license, have, themselves come practically under the control of the I. W. W., have lost the privilege of collective bargaining and the control of shipping arrangements, and stand today on a platform based almost solely on class hatred—sinister, intense hatred for the American shipowner, whether private, corporate or federal.

THE MARITIME CIVIC LEAGUE OF SAN FRANCISCO BAY

AMERICAN shipowners generally and Pacific Coast shpowners particularly have long felt the need of a representation in state and national legislatures. Only recently, however, have they begun to realize that this lack of representation is very largely their own fault, because they have not taken any interest in practical politics. The shipping interests of San Francisco Bay and the industries allied with shipping have invested an enormous amount of capital in their various enterprises, and the Bay of San Francisca is the heart of the Pacific Coast in regard to maritime affairs. This fact is due to the geographical position of the Harbor of San Francisco and to the fact that this harbor was the first on the Pacific Coast to be developed.

After considerable discussion in the shipowners' societies on methods which might be followed in getting better representation in legislatures and for encouraging the electorate generally to take a greater interest in civic activities, a meeting of the maritime interests was called for the evening of August 25 at the Transportation Club rooms at the Palace Hotel, San Francisco. The response was so much greater than had been anticipated that the organization was made permanent.

The new body adopted the name "Maritime Civic League of San Francisco Bay." Captain W. J. Peterson was elected president; Captain C. W. Saunders, first vice-president; F. O. O'Connor, second vice-president; Harry Young, third vice-president; and J. P. Williams, secretary-treasurer. Committees on organization, membership, and meetings will be announced presently.

Captain Peterson, former chief of Police of Oakland, is the general manager of the employment service of the Pacific-American Steamship Association, the Shipowners' Association of the Pacific Coast, and the Waterfront Employers' Union. Captain Charles Saunders is operating manager of the Matson Navigation Company; Frank O'Connor is president of the Shipowners' Association; and Harry Young is president of the California Stevedore and Ballast Company.

Although this first meeting was held on the evening before the state primary election, there is no intention to take any part in the present state campaign. It is proposed, however, there shall be considerable action in connection with the presidential election in November.

The principal objects of the Maritime Civic League of San Francisco Bay are:

First, to insure a proper representation of shipping interests in politics;

Second, to advance all of the interests of San Francisco Bay;

Third, to revive a proper respect for democracy and for civic responsibility in the citizenship of the San Francisco Bay region.

Fourth, it is the purpose of the league to immediately organize at Seattle, Portland, and Los Angeles Harbor and to extend the work to the Atlantic Coast and the Gulf ports, so that by concerted action the shipping interests will be able to elect ship-minded men to state and federal legislatures, so that there may be more intelligence brought to bear upon our maritime problems.

THE IMMIGRATION ACT OF 1924

Its Bearing on the Status of Alien Seamen and on the Operation of Merchant Shipping Under the American Flag

NATIONALITY status of seamen has always been the subject of special and peculiar regulations, and alien seamen on the ships of the American merchant marine have always been the wards of the United States government, enjoying privileges accorded to no other class of aliens—particularly since the passage of the Merchant Marine Act of 1917 and the Immigration Act of the same year.

Recognizing this status, Section 3 of the Immigration Act of 1924 excepts from the general provisions of that act "a bona fide alien seaman serving on a vessel arriving at a port of the United States and seeking to enter temporarily the United States solely in pursuit of his calling as a seaman."

It would seem from the combination of this section with Sections 19 and 20, defining the status of alien seamen, that the bona fide alien seaman's status was not changed by this bill as compared with the Immigration Act of 1917. Taken on its face, there is no distinction between the alien seaman on an American vessel coastwise and the alien seaman on an American vessel foreign. Apparently the authorities of the Department of Immigration, in the absence of new specific regulations from the Secretary of Labor, are going to insist that all alien seamen shipping coastwise on American vessels shall be treated as ordinary immigrants.

ALIEN SEAMEN

Sec. 19. No alien seaman excluded from admission into the United States under the immigration laws and employed on board any vessel arriving in the United States from any place outside thereof, shall be permitted to land in the United States, except temporarily for medical treatment, or pursuant to such regulations as the Secretary of Labor may prescribe for the ultimate departure, removal, or deportation of such alien from the United States.

Sec. 20. (a) Owner, charterer, agent, consignee, or master failing to detain on board such alien seaman until examined by immigration officer, or failing to detain or deport if required by immigration officer, shall pay $1000 for each seaman or no clearance.

(b) Nonappearance on outgoing manifest or report of desertion is prima facie evidence of failure to detain.

(c) Secretary of Labor has option to deport seaman on another vessel and hold vessel that brought seaman for expense of such deportation.

(d) Repeals Section 32, Immigration Act of 1917.

The new act went into effect on July 1, 1924, and almost immediately thereafter an immigration official at Los Angeles Harbor, San Pedro, proceeded to make a test on this interpretation of the law. The American tanker La Placentia had left San Pedro last June for Antofagasta, Chile, and return. Her crew were signed in the regular manner before a United States shipping commissioner for Port San Luis for the round trip and had complied with all the regulations required by the commissioner. Many of the men in the crew had paid their head tax, had taken out their first intention papers to become citizens of the United States, and many of the men had been employed on the same ship for a number of years. But when this vessel returned to San Pedro, the 11th of July, Mr. Gatley, immigration commissioner at San Pedro, took off eighteen men on the grounds that they were alien seamen who intended to work coastwise in the United States and that, therefore, they should be treated as ordinary immigrants, and not having complied with the law regarding vises and other technicalities they were subject to deportation. On the return of the tanker Paul Shoup from Buenos Aires similar action was taken by the same commissioner and over thirty men were taken off.

It is to be noted here in considering this action that these men were not leaving the ship, that some of them had been employed on the same ship for years and that the ship is in regular use both coastwise and foreign. One other man was taken off the tanker Tejon because he stated that he did not want to go foreign and would therefore work coastwise.

Protest of this action was wired to Washington immediately by San Pedro brokers representing the Union Oil Company, owners of the tanker La Placentia. The reply from Washington stated "alien seamen migrating to or returning to the United States to serve on coastwise vessels are to all intents and purposes coming to work in the United States and must have immigration certificates as required by recent Immigration Act."

Mr. Gatley also wired Washington and his action was practically approved by United States Deputy Inspector Sebray. So far as the Los Angeles seizure of men is concerned, the matter has been practically closed and all of the men released either on habeas corpus proceedings or through an action in the United States District Court, during which Judge William P. James handed down the ruling that "alien seamen shipping foreign out of American ports on American ships for a round trip voyage and remaining on the same ship have never left American soil." Judge James therefore ordered the men released.

The action of the Los Angeles deputy commissioner, however, opens up the possibility of a line of action by government officials which would practically put the American merchant marine out of commission, so far as crews are concerned; and that these officials are determined to pursue their tactics is evidenced by an opinion recently given out by William E. Carr, district director of immigration for Southern California. Mr. Carr gives the following interpretation and application of the new immigration bill in explanation of the action of his deputies in taking alien seamen from steamers and tankers:

"Stray aliens coming here on foreign boats are treated as applicants for entry on the same basis as any other alien, but, when an alien seeks to land for any other reason than to reship foreign, he is subject to the immigration vise. A seaman from a foreign country arriving here on a foreign ship is entitled to shore leave for the purpose of reshipping foreign; as soon as he applies for landing for any other reason than

reshipping foreign he is subject to all laws and examinations pertaining to alien immigration—and he is entitled to application only as any other alien.

Aliens Barred Coastwise

"An alien already in the United States and shipping foreign on a United States vessel is, under a recent verbal court decision handed down by Judge William P. James of the United States Federal Court, entitled to be treated as not having left the United States at all; therefore, the law pertaining to aliens found illegally in the United States is applied rather than the law pertaining to the application of an alien for admission."

Act Retroactive

The last clause in this opinion of the immigration official is particularly interesting in view of the fact that one section of the Immigration Act of 1924 makes it retroactive in this respect that "any alien who prior to July 1, 1924, may have entered the United States in violation of this act or the regulations made thereunder" may be deported.

The action at Los Angeles Harbor and the apparent attitude of the Department of Labor are creating a great deal of uncertainty not only among steamship operators but among seamen themselves. Many of the alien seamen who have been employed on American ships for years, alarmed at the possibility of their deportation, are remaining away from shipping offices. It is highly important, therefore, that certain problems in connection with the immigration act should receive immediate consideration and, so far as possible, immediate solution.

Act of 1917

When the Immigration Act of 1917 went into effect, no appropriations of funds or men were made available to carry out its provisions for the first two years, and little or no attention was paid to it by the immigration officers and no attention whatever by shipping commissioners. This inaction caused a condition on board ship among alien seamen that is emphasized at the present time by the activity of the immigration officers and by their apparent intention to prohibit all alien seamen from operating coastwise.

Sixty Per Cent Alien

At least 60 per cent of the deck department on American ships are alien at the present time. The majority of these men have been spasmodically subject to the collection of head tax, but no official head tax receipt forms were provided by the Act of 1917, and in certain ports, and in many cases in all ports, no head tax receipts were issued to seamen when the tax was paid. In other cases shipping firms paid the head tax for men and did not give the receipts to the seamen. Sometimes the head tax receipt was written on a scrap of paper; sometimes it was typewritten on a piece of paper; and in some instances memoranda of head tax receipt were written on papers of first intention to become citizens.

This lack of uniformity has caused a great deal of confusion in the records of the immigration offices and in very many cases where head tax has been paid there is no record existing to prove its payment.

It is very necessary, therefore, at the present time to provide competent ruling or legislation enabling seamen who arrived in the United States legally before July 1, 1924, and can prove such arrival, to now pay their head tax and establish their status as seamen competent to ship coastwise or offshore, as they may elect.

Legislation Needed

It is also necessary to fix a definite time ahead as the date for the operation of the new immigration act, as now interpreted, so as to enable operators before that time to provide themselves with seamen who come within the provisions of the act.

To suddenly and without warning take for deportation alien seamen who for years have been shipping and serving faithfully on American vessels is unfair both to the men and to the operators, and is unworthy of the best traditions of the American government.

THE SPERRY GYRO-COMPASS SCHOOL

THE Sperry Gyro - Compass School has just celebrated its tenth anniversary. Instituted in the summer of 1914, this school has never had an idle day. The first four years of the school were devoted entirely to the instruction of United States and foreign naval personnel, as the output of Sperry gyro-compasses was confined to naval use. The importance of having trained personnel in the navy on gyro-compasses prompted the government to combine the gyro-compass course given by the Sperry school in their electrical schools at Hampton Roads. This allowed the school at the Sperry plant to devote the time to the merchant service personnel, as gyro-compasses were then available for merchant ships.

The school has grown to a point where about seventy-five men and officers per month receive instructions. Due to the fact that some of the personnel only have several days while their ship is in port, the course is so arranged that they can continue the course from time to time, and finally pass an examination and receive a certificate.

This school has also been expanded to include instructions on the high intensity searchlight and the gyro-pilot, familiarly known to seamen as "Metal Mike", and other Sperry navigational equipment.

Inasmuch as the gyro-compass and gyro-pilot have become so universally used, it has been necessary for the Sperry school to open branches in San Francisco, Seattle, Los Angeles, Cleveland, and Liverpool. The Sperry school has been in operation in London for a great number of years.

The course includes the theory of the gyroscope and the gyro-compass, assembly and disassembly, cares, maintenance and operation.

NEW ALL AMERICAN DIESEL

Worthington Pump and Machinery Corporation Develop Original Design of Double-Acting Two-Cycle Type Which Presents Great Claims in Weight and Space Economy

AN entirely new design of two-cycle, double-acting diesel engine, believed to represent the greatest advance in the art yet made in America, and expected to mark an epoch in the development of internal combustion power machinery throughout the world, is now announced by the Worthington Pump & Machinery Corporation. The new engine combines a fuel economy comparable with that of the best existing types of diesel engine, with dimensions, weight and construction cost per horsepower approaching those of reciprocating steam machinery.

These features of the design are due to the fact that the horsepower per cylinder can from all indications be carried to a far higher value than has yet been maintained in diesel practice, thus immensely increasing the field of possible usefulness of diesel-type power, and making it an active competitor of steam power machinery over a much wider range than has before been possible. The first unit built in the Buffalo plant of the Worthington corporation, is very conservatively rated at 600 to 800 horsepower for a single cylinder unit, at speeds of 90 to 120 revolutions per minute.

The new Worthington engine was wholly designed and built in America, and owes nothing to European patents or ideas developed abroad. Behind it is the Worthington company's twenty-four years of experience in building internal combustion engines, culminating in nearly four years of intensive research, study and experiment aimed directly at the production of the result which has now been attained in the new engine.

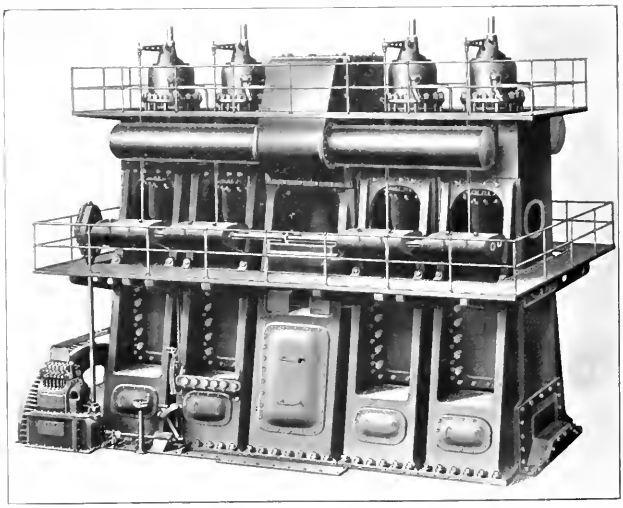
The Worthington corporation has been a leader in American diesel engine production since 1912, in which year the first wholly American design of engine of this type was developed in the company's Buffalo shops. Nearly 100,000 horsepower of Worthington diesel engines are now in active service in the United States. The Worthington type of gas engine has been known since 1900, and over a quarter of a million horsepower of such engines, including the largest double-acting gas engines ever built, are now in use.

The single cylinder Worthington diesel on the test stand. This unit built for experimental purposes develops 600 horsepower at 90 revolutions per minute

The War Fleet Problem

The immediate inspiration behind the research campaign which has now put the company in the forefront, not only of America but of world practice in this type of machinery, was the known need of an improved diesel engine for ship propulsion. It is common knowledge that for the past five years the problem of disposal of the United States war-built merchant fleet, which is the major portion of the entire problem of the American merchant marine, has defied solution. Its difficulties have been two:

First, the fact that under the existing American laws, and with American standards of wages, subsistence, and equipment, the differential in operating costs against the American vessel in competition with those of other countries has been sufficient, in times of low ocean freight rates



A 4-cylinder 2400 horsepower Worthington 2-cycle, double-acting diesel engine as it will appear when completed

such as have prevailed for the past few years, to drive the American vessel out of the market.

Second, the fact that as a result of its war program, the United States Shipping Board is owner of an immense fleet of steamships, which can neither be operated by it in competition with foreign vessels, nor sold to private owners on any basis permitting their operation, and which are consequently laid up in idleness; where their very existence operates as a perpetual threat against the market, keeping freight rates at their lowest level and making any revival of the shipbuilding industry impossible. Yet these ships represent a huge investment of the public money which cannot be abandoned as long as any hope remains of even partly redeeming it.

Suggested Solution

The Shipping Board, headed by former Chairman Benson and present Chairman O'Connor, has long realized and has convinced Congress, that the only hope in this situation lies in the conversion of these idle steamships into motorships, which, as is well known, can operate profitably at rates well below the profit level for steamers.

This problem possessed peculiar interest to the Worthington corporation, for two reasons. As the leading American diesel engine builders, the company's engineers naturally had followed closely the development of this type of power in the field of ship propulsion. At the same time, having been for many years leading builders of marine auxiliary machinery, they were especially familiar with the special problems involved in marine engineering, and on both counts were desirous of contributing, and felt themselves unusually fitted to contribute, to the solution which the Shipping Board was seeking.

The problem before the Worthington engineers, therefore, was to produce an engine with all the advantages of the diesel engine in fuel and general operating economy, but approaching, in dimensions, weight, and speed per horsepower closely enough to steam machinery to permit it to be substituted for such machinery in ships already built at a minimum cost for the engine and for the job of installation.

The leading collaborators in the long research were O. E. Jorgenson, a diesel engineer of international reputation, for the past five years a member of the Worthington technical staff, and Dr. C. E. Lucke, Professor of Mechanical Engineering of Columbia University, New York.

The engine which has resulted is not only expected to form an entire solution of the marine problem which called it into being, but will undoubtedly be of the greatest interest to industrial and mechanical engineers everywhere, as the relation of space, weight and first cost to horsepower is of importance in land power plants as well as in shipping. The new engine is characterized by simplicity of design and construction, and its initial cost per horsepower will consequently be low.

The basic principle underlying the Worthington engine may be briefly stated to be: in the four-cycle diesel engine one stroke in four is a power-stroke; in the two-cycle engine one stroke in two; in the double-acting two-cycle engine every stroke is a power stroke. Its working cycle, therefore, is virtually the same as that of a reciprocating steam engine.

The principle, of course, is not a novel one, but mechanical difficulties, chiefly concerned with the complicated heat stresses in the cylinder of a double-acting engine, make its successful application very difficult. The success of the Worthington design lies in the manner in which the problems of expansion and of heat removal are solved.

Once the major problem is overcome, the great advantages of the double-acting type are evident. The balance of the moving parts, for example, is greatly simplified, and the weight saving, not only from the manner in which the required power per cylinder is distributed through four strokes instead of being concentrated in one, but also from the decreased provision needed to care for the momentum of moving parts, and in other ways, is obviously great.

Cylinder Design

The cylinder of the new engine might be described as composed of two single-acting cylinders, opposed end for end and working in opposite directions, their respective pistons flanged to the same rod, the scavenging and exhaust ports, cooling water circulation and expansion provisions of the two being virtually independent of each other.

Once this fundamental idea of the engine is grasped, the design is seen to be quite simple, following in all respects the best modern standards in diesel engine practice. The plan followed for insuring the maximum strength and rigidity in the cylinder construction, combined with the necessary freedom for expansion and uniformity of heat transference and with economy in materials, is both simple and effective.

Valve Gear

The valve gear presents no particular novelty in design. There are three fuel spray valves, one on top of the upper end of the cylinder, and two in the bottom head on opposite sides of the piston rod, entering at an angle. One of the admirable points of the design is the ingenuity with which these two valves are worked out so as to give a uniform and symmetrical distribution of the charge around the piston rod.

The reversing mechanism, as a point of interest, is second only to the unique cylinder design. Each of the three valves has its own cam, all three geared to the same shaft. The cams are symmetrical, and all that is necessary to reverse the running direction is to shift all three cams simultaneously through 34 degrees on the shaft.

This is accomplished by a worm shaft, which in turn is actuated by an oil-operated hydraulic mechanism controlled by a four-way cock, this in turn being operated by a single lever on the maneuvering platform.

Control Mechanism

The engine is started and stopped by a single lever, which as it is moved forward successively opens the air starting valves, then the fuel supply valves, simultaneously closing the air starting valves; the lever being then capable of setting, by a ratchet and pawl, at any desired fuel supply. To stop, all that is necessary is to throw this lever back to the stop position.

The starting and stopping lever and the reversing lever, though independent of each other in all other respects, are interlocked so that the engine must be brought to a full stop before reversing. Maneuvering control is, therefore, practically as simple and effective as that of a reciprocating steam engine, and much more prompt and efficient than that of a steam turbine. This feature, indeed, of positive, quick-operating reversing gear, is expected to appeal to marine engineers almost as strongly as the more immediately obvious advantages of the new design.

THE CONQUEST OF THE FOG—I

A Brief Statement of the Work Done by the United States Lighthouse Service in Establishing Radio Fog Signals and Developing the Radio Compass

SINCE the earliest attempts of man to navigate by sea, one of his great problems has been means of communication and means of determining his position by night or during heavy weather. The sun, the stars, land marks along the coast being obscured, man is lost at sea having to depend on the rather uncertain figuring of his position by direction and daily progress, which in nautical parlance is called "dead reckoning".

As the majority of dangers to ships comes from the land, the effort has always been to aid navigation along the coasts by some sort of signalling from prominent land stations whose locations were known to the mariner. One of the important functions of all modern governments is the care and maintenance of such stations equipped with every known and well-tried device for the assistance of all mariners along their coasts.

The United States has always taken a very forward looking stand on the question of protecting coastwise navigation and our Lighthouse Service is second to none among those of the marine powers. Our long stretches of seacoast are in large parts subject to great menace through fog, and much of the attention of our Lighthouse Service has been given to the study of fog signals and of apparatus for maintaining the efficiency of shore stations in fog as well as in clear weather.

It is but natural, then, that the Lighthouse Service should have turned its attention to radio as a means of increasing the efficiency of these shore stations. The Lighthouse Service Bulletin of 1912 and the annual report for 1913 mentioned the fact that certain experiments were developing the possibility of "utilizing the directive element of radio signals for the location of vessels in fog." In that same year the French lighthouse service established radio fog signals at three lighthouses. In 1915 and 1916 an effective radio compass was perfected at the Bureau of Standards in Washington, and in 1917 the Lighthouse Service and the Bureau of Standards carried out tests of an automatic radio fog signal transmitting set installed at Navesink lighthouse, New Jersey, and of a radio compass installed on the lighthouse tender Tulip.

This work and the work of other national bureaus led to an action by the Inter-Allied Radio Commission, Paris, 1919, which recommended the 1000 meter wave length for radio beacons. This action was confirmed by the meeting at Washington of the Universal Electrical Communication Union in 1920, and in March, 1923, an American radio conference at Washington recommended that the wave lengths of 952 to 1053 meters (frequencies 285 to 315 kilocycles per second) be reserved for radio beacons. This action was approved by the Secretary of Commerce.

In the meantime the radio compass developed by the work of Dr. Frederick A. Kolster at the Bureau of Standards had been released for commercial development and the patent rights, as well as the services of the inventor, had been secured by the Federal Telegraph Company. Important improvements have been made by this company in the compass to produce a standard navigating instrument with suitable compensating device for any errors peculiar to the vessel and her route, and a large number of installations of these compasses have been made on American vessels operating coastwise and foreign.

The Lighthouse Service has recommended to Congress the installation of radio beacons on a large number of lighthouses and light ships, so as to equip the entire coast of the United States with this directional service. The Lighthouse Service has gone ahead with its program of installation as fast as funds were available and is continuing to do so. It is our desire in this article and succeeding articles to point out the desirability of funds being made immediately available for the prosecution of this work.

The average first-class shore station of the Lighthouse Service, including the lighthouse construction, lights, the machinery for producing sound signals, and other apparatus, involves an investment running well into six figures. The usefulness of such a station is limited by the visibility of the light, which in perfectly clear weather is the horizon, or, at the outside, from 30 to 45 miles, depending on the height of the light, while in fog this useful sphere is brought down to an almost negligible distance. The installation of an automatic radio beacon at any lighthouse immediately increases its sphere of usefulness to the area of a circle whose radius is under all conditions not less than 150 miles and under perfectly clear radio conditions may easily reach a thousand miles. The cost of installing the apparatus to make this possible will not exceed $3500 per station.

It would seem that insurance of this sort for a premium of not more than 3½ per cent ought to be exceedingly good business, especially when it is considered that the presence of these automatic radio beacons does not in any way increase the maintenance expense of the personnel necessary at the lighthouse.

The preliminary project for radio fog signal stations for the coasts of the mainland of the United States, Alaska, and Hawaii comprises forty-seven installations, or the expenditure of less than $156,000.

The completion of this project will make possible the navigation of all our coasts in fog with a certainty and a safety at least equal to that which our navigators now enjoy in the clearest of weather.

It will make possible a much greater surety of correct position at sea for all our offshore vessels.

It will multiply the usefulness of every shore station under the Lighthouse Service many times.

It will put the Federal government in a position to legislate radio equipment for the prevention of disaster on all American flag passenger vessels.

All this for less than the cost of one first-class lighthouse, and the work is delayed because funds are not available.

TRADE AND TRAFFIC TRENDS

A Department Devoted to the Interests of Exporters, Importers, and All Ocean Shippers

TRAMP SHIP TRADES

An Interesting Analysis of the Movement of Bulk Cargoes in World Trade and Particularly of the Tonnage Carried in Ships of the Non-Liner Class

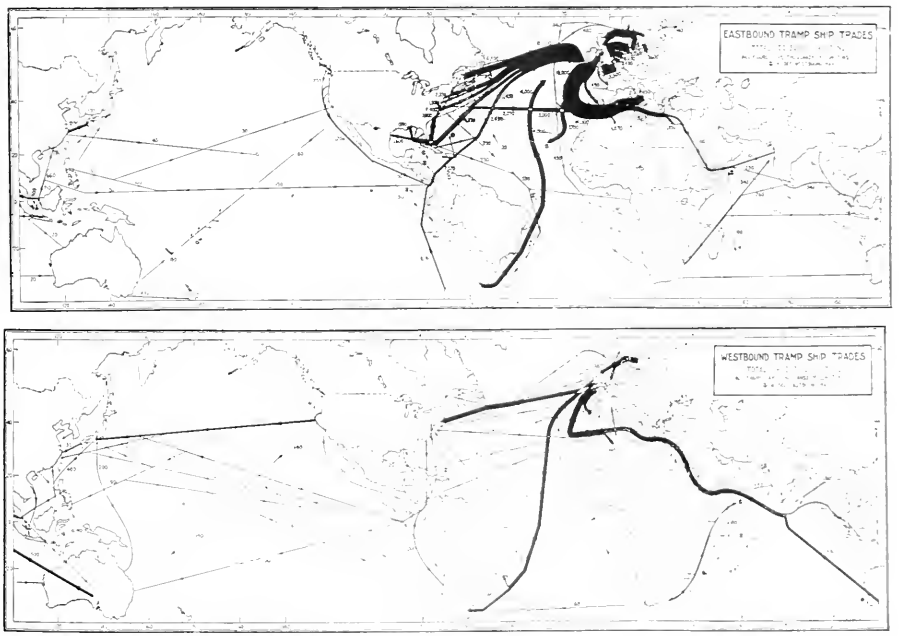
By E. T. CHAMBERLAIN

IN a recent issue of Commerce Reports, E. T. Chamberlain of the Transportation Department presented a very interesting and exhaustive analysis of the tonnage moving in world trade, and particularly of the tonnage carried in tramp ships. We here present an abstract of this article.

The gradual trend of marine transportation has been toward greater size ships and greater speed and toward regular line service and combinations of regular line services. With this trend there has always been a vast amount of traffic carried by irregular ships, known as tramps, the difference between tramps and liners being now a matter of difference between fixed routes with regular sailing schedules and no fixed route or regular sailing schedule. The larger size and speedier tramps of today would merge, so far as physical characteristics go, with the smaller size and less speedy vessels of the liner class. Regular lines have shown a decided tendency to specialize rates through conferences and combinations. This has been particularly so since the advent of steel and the increase in size of ships and reduction in costs of ocean transportation.

Before the war, 35 per cent of British steam tonnage was in the liner class. At the present time the tendency toward large steamship corporations in Britain has led to a larger proportion of British tonnage being classed as liners. Six corporations own 8,000,000 gross tons, almost half of the British steam tonnage employed in the world's foreign and colonial trades. If we accept the limitation line in speed at 12 knots, we find that the world's steamer tonnage above this speed is no greater than before the war, although nominally, owing principally to American war construction, the total world steamer tonnage has increased 33 per cent. It will be seen then that the

EXPORT MOVEMENTS OF WORLD'S SEA-BORNE BULK CARGOES IN 1922



General movement of bulk cargoes in 1922

[In thousands of long tons]

From—	Sent to other continents	Received from other continents	Intra-continental	Total
Europe	15,560	31,980	66,370	113,910
Asia	2,750	5,270	7,730	15,750
Africa	5,500	4,640	140	10,280
Total, Old World	23,810	41,890	74,240	139,940
North America	21,840	7,710	[1] 7,710	37,260
South America	6,170	4,360		10,530
Australia	3,120	[2] 960	530	4,630
Total, New World	31,130	13,030	8,240	52,420
Grand total	54,940	54,940	82,480	[3] 192,360

[1] See footnote 1 to preceding table.
[2] Include 650 tons of British coal to countries not specified.
[3] Necessarily to put its item of 54,940 as both export and import

American war construction was mainly of the tramp type and it should be borne in mind that the great proportion of this is owned by the government and, so far as operated, is employed on regular steamer lines. This is largely due to the fact that the Merchant Marine Act of 1920 was passed on the principle of liner service and that that principle in practice now rules the American merchant marine both private and governmental.

Weight of Cargoes in World's Seaborne Commerce

A British Committee in 1916, after careful consultation, estimates total volume of the world seaborne commerce in 1912 as between 250,000,000 and 300,000,000 tons, of which more than half appears to have originated in the British Empire, the figures for that year and for some time previous having been swollen by the large exports of coal from the United Kingdom. The seaborne commerce in 1922 had not regained its prewar volume and its routes had considerably changed. So far as computed, in weight, the foreign and colonial trade of the United Kingdom for 1922 totaled 112,000,000 long tons as compared with 133,000,000 tons in 1913.

It will be interesting to those who are studying the world's trade movement to note from the attached table, the preponderance of Europe in the tramp trade movements. The charts show that 80 per cent of the transportation of bulk cargoes is concentrated around the coasts of Europe. British coal, alone, in its movement to Continental, North Sea, and Channel ports is responsible for over 30,000,000 tons. The bulk export movement from the Americas to Europe is about 25,000,000 tons.

Of particular interest to American marine operators is the unbalanced trade across the North Atlantic. To quote Mr. Chamberlain, "The necessities of life are ried in bulk across the Atlantic from our Atlantic, Gulf and Pacific ports by vessels of which half arrive here in ballast or only partly loaded. The disparity is usually even greater than the charts show because of the 5,800,000 tons which moved westward in 1922 from Europe to North America nearly 4,000,000 tons were British coal imported on account of the coal strikes in the United States."

The bulk trade across the Pacific from America to Asia is also unbalanced, though not to so great an extent. Looking at these movements "one may readily see why the American tramp steamer was built less than thirty years ago and why under normal conditions so few have been built for private shipowners." It is proof that tramps or liners cannot profitably be operated in carrying cargoes only one way. The charts show an eastward movement of over 100,000,000 tons of bulk cargoes and a westward movement of less than 20,000,000 tons. On the west coast of Europe and the east coasts of North America and Asia there are large movements of bulk cargoes in a general direction north or south. These are traced on the charts according to eastward or westward trend. It is these movements that permit those triangular voyages with cargo that are so essential to profitable tramp employment.

"The latter operations contribute as much to a country's maritime power as do operations based on the ports of the mother country. In Sir Norman Hill's estimate of the prewar division of British liners and general traders already quoted, 300 liners of 1,050,000 net tons, or a third of their total number and tonnage, were employed solely between ports outside the United Kingdom, while 1300 British tramps of 3,120,000 net tons, or more than half of their number and tonnage, were so employed. In the first half of the nineteenth century American square-rigged ships were often employed in trades other than the United States. The percentage of a country's exports or imports carried in its own ships is thus an imperfect measure of that country's maritime importance, and especially of its maritime enterprise."

SUMMARY OF LIMITATIONS TO DISCRIMINATING DUTIES

MISUNDERSTANDING prevails generally concerning the treaties between the United States and foreign countries, particularly as to their stipulations limiting the right of the United States to levy discriminatory custom duties and tonnage dues. To remove this misunderstanding, Professor Charles C. Thach of Johns Hopkins University has made, for the Council of American Shipbuilders, Inc., a survey in a brief, concise and intelligent report in which he disclosed the provisions limiting the right of the United States to impose discriminatory custom duties and tonnage dues and discusses the function of Congress in abrogating or modifying such treaties.

The following abstract of this survey will give a complete understanding of the subject.

Any vessel authorized by national law to fly the national flag of the Argentine Republic, Belgium, the Congo, Italy, Japan, Paraguay, or Spain can claim under existing treaties complete right to be treated on the same terms in harbors of the United States with respect to tonnage dues as are vessels of the United States, and this without respect to the question of whether they are bound directly to or from a national port. No discriminatory tonnage dues can be levied on them without violation of an existing treaty.

Vessels belonging wholly to the nationals of China

(Continued on Page 493)

Pacific Marine Review

PELORUS JACK

A Complete History of the Wonderful Pilot Fish of New Zealand

By WILL LAWSON

Pelorus Jack in action near the French Pass, New Zealand. Photo taken September, 1911, by Edgar Warwick.

MANY extraordinary accounts have been published concerning Pelorus Jack, the dolphin which used to meet coastal steamers off Pelorus Sound in Cook's Strait, New Zealand. In almost all of these he has been described as a pilot of supernatural powers, and when the news of his disappearance and probable death was reported, no less fantastic were the causes of death suggested. The truth is that Pelorus Jack was a Risso's dolphin (Grampus griseus). About fifty years ago a school of these white dolphins, which are rare in the southern hemisphere, frequented French Pass and Pelorus Sound, and it is presumed that Jack was the sole survivor; or it may have been that when the school departed for other seas, he stayed. At any rate, for over thirty years, to the knowledge of white men, this dolphin made a habit of meeting steamers at French Pass or Pelorus Sound and accompanying them between these points.

The beat of the propellers would be heard by Jack many miles away, and both for the sake of companionship with the bigger sea monsters and the opportunity of scraping barnacles off the keels and stems of the vessels, the white dolphin seldom missed a chance to meet the steamers. Even at night he would come out to play in the phosphorescent waters, like a ghost of the deep tides.

While the white man's history placed Jack's age at two score and ten, according to Maori mythology, Jack's age, when he disappeared a few years ago, was reckoned at 285 years. Even allowing for the longevity of the whale family, this seems an exaggeration. Still the Maroi claim that Pelorus Jack was the atua or personal god of Matua-hautere, who was a descendant of Kupe, the Polynesian navigator who discovered New Zealand and showed the way to the emigrants from northern islands who settled in New Zealand. When Matua-hautere crossed the sea of Raukawa, as Cook's Strait was called, there went with him this god-fish. In the Maori story the dolphin played the part of pilot and led them into Pelorus Sound, where the tribe settled, and the fish lived in a cave near the mouth of the Sound. Whenever they went out in their canoes the fish led the Maori, often saving them from danger.

His greatest feat was when a chieftainess, Hinepoupou, swam from Kapiti Island to D'Urville Island, fully thirty miles away. Then Kaikai-a-waro, as the fish was called, left his cave and swam across the straits to meet Hinepoupou, whom he conducted safely to her destination. The story of this swim of Hinepoupou is true, for Maori women often swam long distances when driven by love or fear, and doubtless a sea monster, possibly Pelorus Jack, appeared during the swim and was hailed as a friendly god, for this happened in the later years of Maori history.

When the white men's steamers came, Pelorus Jack devoted all his spare time to them, and eventually, so popular did he become, an Order-in-Council was gazetted on September 29, 1904, declaring him to be protected. The penalty for any interference with him was to be not less than £5 or more than £100. The direct cause of this proclamation was the action of passengers and fishermen, who sometimes tried to shoot the harmless creature. On one occasion it was claimed by a passenger on the old coaster Rotorua that he had struck Jack with a bullet from a rifle. He certainly fired several shots, and after that Pelorus Jack never showed himself when the Rotorua passed. This may sound incredible, yet the explanation is simple. The regular boats all had different beats of their propellers and an animal of the whale family would be intelligent enough to associate danger with the sound of the Rotorua's propeller.

One of Jack's favorites was the Pateena, a ship with a big single screw and a good turn of speed. It was thrilling, in the dusk, when the Pateena swept through French Pass and paused to land mails at Cabbage Bay, to see Pelorus Jack spout in the calm dark water, a cable's length ahead of the ship. There he would play till the first turn of the engines made the ship vibrate. Then, as swiftly as a bird, he rushed towards the bows and, while the steamer was gathering way, he rolled and turned and gamboled about the forefoot. At full speed he could never have done this, and as the speed increased the white dolphin's movements became swifter, till he moved like lightning, now on one side of the bow, now leaning against the stem, now on the other side, the water streaming off his glistening shape. Every now and then he "blew" through the foam of the ship's speed. He would keep this up for miles, till, off the Chetwode Islands, near Pelorus Sound, he would suddenly dart away into the dark depths, no doubt to seek his cave retreat.

(Continued on Page 166)

FROM IRON STEAMERS TO STEEL MOTORSHIPS

A Glimpse at the Past and Present of a Famous Shipbuilding Plant

By G. H. RICHARDSON

WHEN old Captain Whilldin of the steamer Sun, running between Philadelphia and Cape May as a passenger boat, stepped into the offices of Betts, Pusey and Harlan on a certain day in the early forties to obtain a new engine cylinder to replace one that had cracked, he little realized what a millstone his visit would prove to be in the history of the company, itself, and in the shipbuilding history of the country.

The visit was epoch making in the history of the company because it was not only the first marine job embarked upon, previous work having been confined to car building, land engine repairs, etc., but it was also a very out-of-the-ordinary job. Such a thing as a large steamboat cylinder was a novelty to the majority of founders and engineers all over the country in those days.

The 120 ton hammerhead crane at Harlan

It was epoch making in the history of the industry because it led to the establishment of the first iron shipbuilding yard in the country. The nerve of Samuel Harlan, Jr., led to the acceptance of the job and it was his pluck and energy, together with that of Elijah Hollingsworth, who had just come into the concern, that brought it to a successful completion. This settled an issue that had been raised and it was definitely decided to enlarge the facilities of the organization and go after marine work.

From records it seems as though there may have been some experimenting with iron construction for barges and other small craft at an even earlier date. It is certain, however, that the concern, which was then known as Betts, Harlan and Hollingsworth, constructed two iron steamers known as the Ocean and Ashland, respectively, which were delivered in 1844. They were small boats, each less than 100 feet long, and intended for inland use. It so happened, however, that they were sent to New York, their destination, by the outside route instead of the inland route and hence were the first iron steamers in the United States to go to sea.

Iron Steamer Bangor

The most interesting vessel from an historical standpoint, however, was the steamer Bangor. Iron as a material of construction in shipbuilding had become accepted as a fact in Great Britain by 1843, but in this country it was still a new thing. The Bangor was the first iron seagoing propeller steamer constructed in the United States. Work was started on her in October, 1843, and the launching took place eight months later in the summer of 1844.

In looking over the trim snappy lines of a private yacht launched from the same yard eighty years later, it is hard to realize the crude clumsy beginnings of metal shipbuilding; and yet in her day the Bangor was in the vanguard of progress. Boating enthusiasts, regardless of their particular hobby, cannot but be interested in a short description of this steamer.

The Bangor was of 231 tons burden and had an over-all length of about 131 feet. Her molded breadth of beam was 23 feet. The hull was formed by bar iron

View of the H Wilmington from top of the big crane

First Iron Screw Propeller Steamer in the United States
Built by Jeremiah Simpson Hillmeworth Company
Wilmington Delaware. In 1843 &
Purchased by the Government, was renamed

ribs or frames secured by wrought iron clamps. The plating was put on in the lapped or clinker style. She was intended for passenger and freight service and was fitted up unusually well for those days. Independent twin screw propeller engines, having cylinders 22-inch diameter and 24-inch stroke, furnished the propulsive power. The propeller wheels were of the Loper type and 8½ feet in diameter.

On her speed trial made on the Delaware River from the Philadelphia Navy Yard to Fort Mifflin and return, with the tide against her in one direction and favorable in the other, an average speed of 10.61 miles per hour was attained. The maximum speed, deducting for tide, was 11.57 miles per hour. The total distance run was 16 miles and the steam pressure 46 pounds.

The Bangor had a rather varied and checkered career, in which fire, shipwreck and war service entered, until finally in 1848 on transfer to a private owner all further trace is lost.

For many years commercial shipbuilding, and during the Civil War, government work occupied the attention of the company. Vessels and boats of all kinds and classes were included and there is reason to believe that the steamer Olympian, built for the Oregon Railway & Navigation Company, in 1883 was the first steamer constructed of steel in this country.

Steam Yachts

As far as marine work is concerned, the Harlan Plant has always specialized on craft for commercial purposes, most of these being of the larger sizes, but it was quite natural that sooner or later it should get into highly specialized work such as that of yacht building. The first activities of this kind were more or less of an experiment, for the general feeling in those days was that such work was not serious or important enough for a commercial shipyard to pay much attention to, even though it called for the exercise of the highest degree of skill.

The venture proved a big and immediate success. The Meteor, the first steam yacht, made a brilliant record, and the Mischief, the first sailing yacht built built at the same time (1876-1879), also did much to show the possibilities of vessels of this kind and more than repaid the builders' care and attention given in building them.

Even success, however, did not immediately cause the concern to rush into this field. Gradually, with the acquirement of added profitable experience, the feeling of the management changed and much attention was given to the new branch of work. By 1886 steam yachts well known in their day, such as the Victor, Dione, Electra, Alva, and others, and sail yachts such as the Priscilla and the Julia, all marking a rapidly growing popular interest in pleasure craft of this description, had been turned out and the status of the organization as a builder of high grade craft was fully established.

The later history of the plant is one of continuous development which reached its peak at the time of the World War. Both commercial and pleasure craft are still built and the product of these later days, as mentioned before, stands out in interesting contrast with the first boats built.

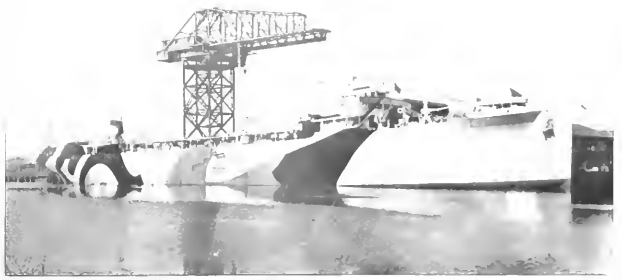
Let us take, for example, for the purpose of this comparison, two types of vessels which are not only typical of the class of work done at this plant but stand out as representative jobs.

Modern Motor Yacht

At one extreme we have the Georgiana III, a single screw motor yacht designed by E. Fredd Ortlip and built for William G. Coxe, former president of the company. The general dimensions were as follows:

Length over-all	95′ 2½″
Beam molded	15′ 0″
Depth molded above base	10′ 5″
Draft	5′ 6″

Designed with a straight stem and cruiser stern, with a raised turtle forecastle deck and one signal mast, she was propelled by a Harris diesel-type motor, having four cylinders 9 inches in diameter with a 13-inch stroke, and developing 150 brake horsepower or



240 indicated horsepower at 300 r. p. m. on a weight, including flywheel, of 22,000 pounds. Capacity of air bottles was 39 cubic feet, and oil tanks were of sufficient size to give a cruising radius of 2000 miles. Ignition by temperature of compression, directly reversible from full speed ahead to full astern in five seconds. From stone cold to full power in ten seconds.

The Georgiana III at the time of her construction was representative of the best in modern motor yacht construction.

Bulk Oil Carriers

The largest vessel ever built at this yard was the oil tanker J. A. Bostwick for the Standard Oil Company of New Jersey. Her dimensions were:

Length between perpendiculars	465′ 7″
Beam molded	60′ 0″
Depth molded to shelter deck	36′ 3″
Deadweight, tons	11,720

This vessel was built on the longitudinal system of framing, in accordance with Lloyd's rules, and designed as a single screw steamship with straight stem and elliptical stern and rigged with three steel pole masts. The propelling machinery is aft and the hold divided into nine double tanks for carrying oil in bulk.

A set of quadruple expansion balanced engines and three Scotch type boilers fitted with forced draft makes up the propelling machinery.

Tankers for Foreign Owners

In 1839 the Harlan Plant solicited orders in Europe for passenger cars and the result was that the first cars built in this country for export shipment were built at Harlan. It is an interesting coincidence that the first vessels ever built in an American shipyard for a foreign owner were built at the Harlan Plant. These were the noted "Shell" boats, Silver Shell, Gold Shell, and Pearl Shell, a type of 8400-ton tanker that won a high reputation both at home and abroad. These ships were built in 1915 and 1916 for the Anglo-Saxon Petroleum Company, Ltd.

Such, in brief form, is the history of the Harlan Plant up to and including its acquisition by the Bethlehem Steel interests in 1904. It now remains to describe the plant as it is today.

When Mahlon Betts and Samuel Pusey formed their partnership in March, 1836, it was for the purpose of building railroad passenger cars, and that business has been carried on ever since in increasing volume until the Harlan Plant is one of the big builders of this equipment today. It is not the purpose of this article, however, to deal with car building, mention simply being made because the experience gained and equipment used in it has, to a certain extent, been very useful in the shipbuilding end of the business, as will be seen later.

Interior finish on yachts built at Harlan Plant

The Harlan Plant is located at Wilmington, Delaware, on the banks of the Christiana River, which flows into the Delaware River a short distance below, thus affording a deep water connection with the sea. Here are built steel vessels of all kinds. The plant is particularly well adapted for handling light weight and heavy steel hull construction, the range in sizes varying from small work, such as metallic life boats, to 11,000-ton passenger, cargo, and tank ships.

Docking facilities for ship repair work are provided as follows:

A graving dock, 348 feet long, which can take vessels up to 345 feet in length and with a maximum draft of 12 feet;

Fitting out or repair dock, served by a large hammer head crane, having a capacity of 120 tons at a 60-foot radius, or 30 tons at a 97-foot radius, and 15 tons at a 110-foot radius on the auxiliary hoist.

Reference to the aeroplane photograph which illustrates this article will make it possible to visualize very clearly the general layout of the plant and the location of the five shipways. It will be seen from this photograph that the shipbuilding activities form a distinct division apart from the car building end, except insofar as those shops are concerned which serve the whole plant, and these are so located that they are central to both divisions.

(Continued on page 34, Ad Section)

The bending slabs, Harlan

Pacific Marine Review

AN INTERESTING FLOATING DRY DOCK

William T. Donnelly of New York Building New 15000 Ton Floating Dry Dock for Wallace Shipbuilding and Drydock Company, Ltd., of Vancouver, B. C.

AN interesting floating drydock, designed by William T. Donnelly of New York and built under his supervision, is now being completed by the Wallace Shipbuilding & Drydock Company, Ltd., of North Vancouver, British Columbia.

This dock when completed will consist of eleven timber pontoons, four in the small section and seven in the large. The two steel wing walls in each section extend and will extend contiuously over the four and seven pontoon sections respectively. The dimensions of the pontoons, all of which are identical in size, are as follows:

Length (corresponding to over-all width of dock)	126′ 0″
Width	44′ 0″
Depth	14′ 6″

The smaller section of the Wallace Dry Dock at Vancouver with the steamship Prince John and two tugs up.

On the two end pontoons outrigger platforms have been built.

The small section now in operation is 178 feet 9 inches over the wing walls and 240 feet over-all. In order to obtain the greatest possible length over the keel blocks, both outrigger pontoons are being used. Upon the completion of the entire dock one of these will be removed and transferred to the large section. Its place will be taken by one of the pontoons of the large section. Work is now proceeding steadily upon these and also upon the fabrication of the wing walls for the large section. The entire dock should be completed before the end of the present year.

The general dimensions of the completed dock will be as follows

Length over-all	556′ 6″
Length over pontoons	495′ 6″
Width over-all	126′ 0″
Clear width between wings	98′ 0″
Height of wings	37′ 0″
Width of wings at base	14′ 0″
Width of wings at top	9′ 6″

Electric power for operating the small section now in operation is generated by the British Columbia Electric Railway Company, Ltd., at the hydro electric plant, Lake Buntzen and Stave Falls, British Columbia. It comes into the yard at 2200 volts and is transformed in the plant to 440 volts or 220 volts as wanted. Two 125 horsepower alternating current motors located upon the decks of the wings drive through horizontal and vertical shafting the eight 12-inch centrifugal pumps, two of which are situated in each pontoon. These pumps when driving at a speed of 250 revolutions a minute have a capacity of 4200 gallons a minute against a head of 20 feet.

On March 18 the small section was placed in commission when the steamship Camosun of the Union Steamship Company of British Columbia, Ltd., of Vancouver was docked. Since that time the structure has been quite busy. Thirty-seven dockings of vessels, large and small, have taken place up to the present time and there is every indication that the structure will be busier than ever in the weeks to come.

The structure when completed will have a lifting capacity of 15,000 gross tons and will take a draft of 24 feet over 4-foot keel blocks.

Above—View of the deck of the starboard wing of the small section of dock showing one of the four flood gate valve operating stands, one of the four flapper valve operating stands, the motor house, and the horizontal line shafting driving the pumps. The graduated spars are the water gauges for the pontoon. At right—View looking down on the small section of the dock showing the general arrangement.

WORLD'S MOST MODERN PASSENGER LINER

Union Steamship Company Building Quadruple Screw Diesel-Engined 23,000 Ton Motorship for Vancouver-Sydney Run

TOWARD the end of 1922 there was laid down at the Govan yard of the Fairfield Shipbuilding Company, Ltd., a passenger liner ordered by the Union Steamship Company of New Zealand for their Vancouver-Sydney service. This vessel was launched about June 17 and is expected to be in service early in 1925.

She is to be propelled by quadruple screws driven by diesel engines. Her dimensions are: length, 600 feet; beam, 72 feet; molded depth, 46 feet 6 inches; loaded displacement, 23,000 tons. She will have six decks arranged for passenger accommodation and will carry 440 first class, 300 second class, and 230 third class passengers, with a complement of 330 officers and crew. She is designed to have a sea speed of about 18 knots.

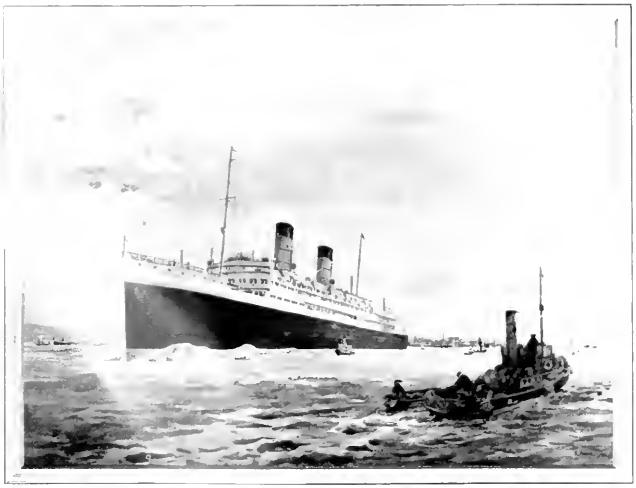
First-class cabin corridor on the Aorangi.

Her dimensions and her passenger capacity entitle her to be placed at the top of the merchant steamers trading to the South Pacific Ocean. No expense has been spared in the design, construction and outfitting of public rooms and private accommodations for passengers, and in consideration of the fact that this vessel will be the initial first-class passenger liner to use diesel engine propulsion, we grant her the title of the "Most Modern Passenger Vessel Afloat."

The Cloud Piercer

Her owners, the Union Steamship Company of New Zealand, have named this vessel the Aorangi (the Cloud Piercer), a name which may well be prophetic, for this fine ship is indeed the concrete argument needed to pierce the mental clouds of doubt regarding the application of the diesel engine to propulsion.

As will be seen from the illustrations used with this article, the Aorangi maintains all of the high standards of comfort and elegance set up by modern ocean liners of the first class. Eleven per cent of the first class passenger accommodation is in single berth cabins; 76 per cent in two berth cabins; and the remainder in three berth cabins. For the second class passengers there are some four berth cabins, but the greater majority are accommodated in two berth cabins. Even in the third class not more than four persons are arranged for in any one room. All of the sleeping compartments in the ship have both natural and forced ventilation, with ozonized air, and all of the first and most of the second class accommodations are equipped with electric cabin fans, bells, and telephones. Two modern electric passenger elevators communicate with all decks. The heating of all accommodations is effected by an especially designed low pressure steam system. This system will be under the individual control of passengers and steam circulation is insured by a vacuum pump system on the exhaust side of the radiators. Electric heaters are also provided in many staterooms and public rooms.



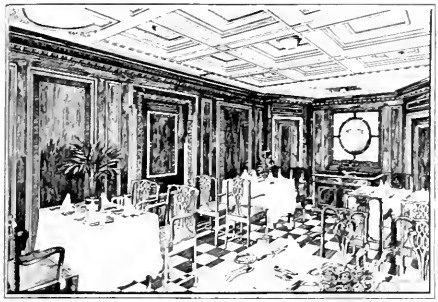
Propelling Machinery

As previously mentioned, the Aorangi will be propelled by four screws driven by diesel engines. These engines are of the Fairfield-Sulzer type, each engine having six cylinders of 27½ inches diameter and 39 inches stroke and developing 3900 indicated horsepower at full load.

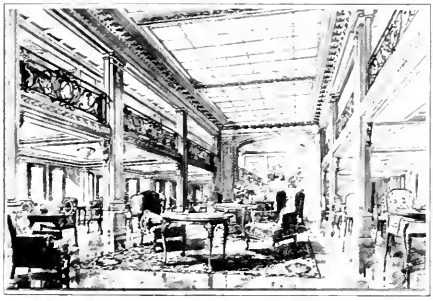
The design of the engines embodies several departures from normal Sulzer practice. The bearing surfaces have been increased to reduce pressure. Much heavier framing is incorporated, particularly in the columns and bedplates. The soleplate has been altered and is built with a flat base arranged to permit direct attachment to the tank top. The double bottom framing in way of the propelling machinery is made es-

INTERIOR VIEWS ON AORANGI

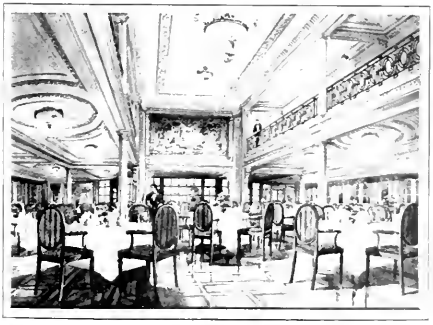
World's Premier Motor Passenger Liner



Small dining room for private parties.



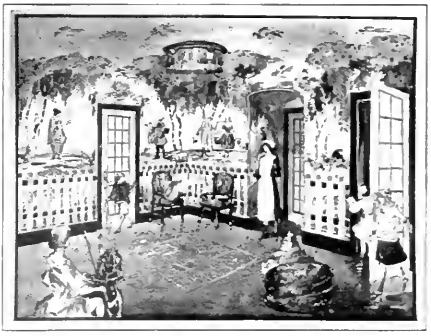
First-class lounge.



First-class dining saloon.

The appointments and finish of the passenger accommodations on this vessel compare favorably with those of the best steam liner afloat.

The palatial smoking room.



The nursery.

A de luxe suite with bath.

pecially deep and is strengthened considerably to distribute the load and stress due to propulsion.

In place of the usual rotary valves controlling the supply of scavenge air through the upper row of scavenge ports, the engines of the Aorangi have groups of multiple disk valves fitted in the scavenging trunk. These valves admit air through the control port as soon as the exhaust air in the cylinder falls below the pressure of the scavenge air in the trunk. Conversely, these valves are closed as soon as the compression pressure from the cylinder exceeds the scavenge air pressure. The position of the control stand is at the level of the cylinder tops, and situated on each engine at the forward end above the injection air compressors.

Scavenging air is provided by separate motor driven rotary blowers. There are three of these blowers, each of them being capable of supplying the normal scavenge air for two engines. The main engines are arranged in parallel in one engine room and the principal auxiliaries are in a separate compartment. Salt water is used for both piston and jacket cooling, and the piston crown is flooded under all conditions of running.

Cargo

The Aorangi will carry 225,000 cubic feet of general cargo and express packages and 90,000 cubic feet of refrigerated cargo, including fruit, meat, and dairy produce.

Diesel Advantages

It will be noted in the illustration showing the artist's conception of the Aorangi when she is finished that she carries two funnels. One of these will be used for exhaust and engine room ventilation; the other is a dummy. Old timers will be glad that the Union Steamship Company has retained the real steamship lines. The absence of boilers and uptakes to the stacks allows a decidedly better arrangement of passenger accommodations and a considerable saving of space in the most valuable part of the ship for that purpose.

The Aorangi's bunkers have a capacity to hold ample oil fuel to take her over the round voyage of 15,000 nautical miles from Vancouver, British Columbia, to Sydney, New South Wales, thereby enabling her owners to purchase all oil fuel at the most economical point on the route.

The fire room crew is eliminated and the entire ship made much more comfortable in the tropics on account of the fact that the diesel engine method of combustion condenses the generation of heat in a comparatively small space, and that heat is taken care of in a way that does not affect the living spaces of a passenger vessel.

The operation of this most modern passenger vessel will be watched with great interest and her performance on one of the world's best test routes will give great impetus to the dieselization of the world's merchant fleet.

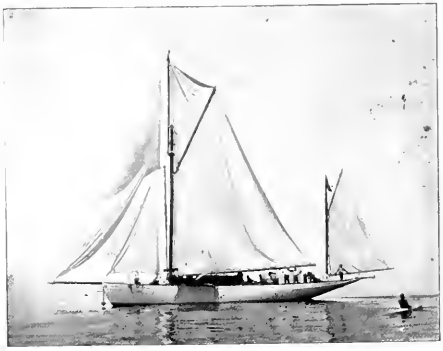
PELORUS JACK

(Continued from Page 459)

For thirty years Pelorus Jack kept touch with the steamers. Then, during the war, he went amissing, and set everyone guessing as to the cause of his disappearance. About that time, a fleet of Norwegian whalers was working in New Zealand waters, and many people believe that they had accounted for Pelorus Jack.

When the carcass of a white dolphin, with a deep gash in its side, was found on a Cook's Strait beach, this idea began to crystallize into certainty, until Captain Post, commander of the government steamer Tutanekei had gathered and reviewed the evidence. Captain Post stated most emphatically that the wound in the side of the dolphin could only have been caused by the wing propeller of a twin screw steamer. The only vessel running at that time which could be connected with the dolphin's death was the Arahura, a fast coaster of 1500 tons and a favorite of Jack's, possibly on account of the thunderous noise her propellers made under water. Captain Post believes that in his gamboling Pelorus Jack lost his balance, as a man might in walking, and before he could recover and dart clear the tip of one of the spinning propellers caught him and ended his interesting career.

But in the records of white New Zealanders, as in the Maori mythology, Pelorus Jack will never be forgotten. His name was a household word throughout the island dominion, and had it been realized in time that the carcass with the gash in its side was in all probability his, it would have been preserved and become a museum exhibit of undying interest.



SOUTHERN PACIFIC STEAMER BIENVILLE

Todd Drydock and Construction Corporation at Tacoma, Washington, Launches Freight and Passenger Steamer

THE new steamer Bienville for the Atlantic Coast lines of the Southern Pacific Company was launched at the Tacoma yard of the Todd Drydock & Construction Corporation on July 16, 1924. Contract for this vessel was signed November 7, 1923, and delivery date is set for December 7, 1924, at New York.

A full description of the machinery of the Bienville will be found in Pacific Marine Review for March, 1924. For the convenience of our readers we summarize the information contained in the former article and append some new information on her passenger accommodations.

The Bienville is 445 feet 0 inches, length over all; 428 feet 0 inches, length between perpendiculars; 57 feet 0 inches, beam; 37 feet 6 inches, depth to hurricane deck. On a draft of 25 feet 6 inches, she carries deadweight of 7000 tons. Her propelling machinery consists of six Babcock & Wilcox water-tube boilers, burning fuel oil, and one set of De Laval double reduction gear, cross compound turbines, driving a single propeller and developing 7100 horsepower at 85 revolutions a minute. This machinery is calculated to drive the ship regularly at a sea speed of 16 knots. The Bienville is built on the Isherwood system, with three complete steel decks, hurricane, main, and lower, and with promenade and boat decks on the superstructure. Seven watertight athwartship bulkheads complete the subdivision of the hull to suit the requirements of the United States Steamboat Inspection Service for passenger vessels.

The Southern Pacific Company's steamer Bienville sliding off the ways at the yard of the Todd Drydock & Construction Corp., Tacoma.

The oil is carried in two deep fuel oil tanks forward and aft of the boiler room running from the lower deck to the shell, each tank being subdivided into three by fore and aft bulkheads.

In order to insure rapid handling of cargo, twenty hinged cargo ports are provided for access to the lower main 'tween decks and in addition an ample hatch for each hold.

Passenger and Crew Accommodations

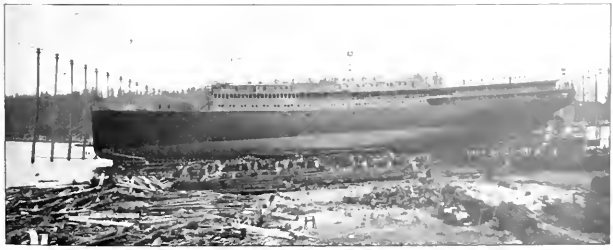
The crew's quarters are very complete and convenient, the deck crew being housed in the winch house forward on the hurricane deck, and the officers on the boat deck.

The third class passengers are carried six in a room on the main deck forward, and provision is made for 111 in this class.

Accommodations for 237 first class passengers are in rooms on the hurricane and promenade decks. Nearly all of the first cabin staterooms are outside rooms of extra large size, a number of them with private baths. They are paneled in white, sides and overhead, and are fitted with extra wide metal berths for the lower with folding mahogany Pullman berth above, also pull-out, spring, tapestry upholstered davenport convertible into a berth if necessary. There is running water in each room, large mahogany wardrobes and dressing tables, thermos bottles, and full supply of necessary hardware. The decks throughout the first class accommodations are laid with rubber tile covered with Lowell Wilton carpet. Each berth has a reading lamp and each stateroom an electric fan and an Electro-Vapour radiator.

The general scheme of decoration in the public rooms is mahogany wainscoting with white panels above, ceilings having cupped beams and sunken panels between beams. All decks are laid with marble design rubber tile. The main dining saloon has a sitting capacity for 200, arranged at small tables accommodating four, six, and eight persons each.

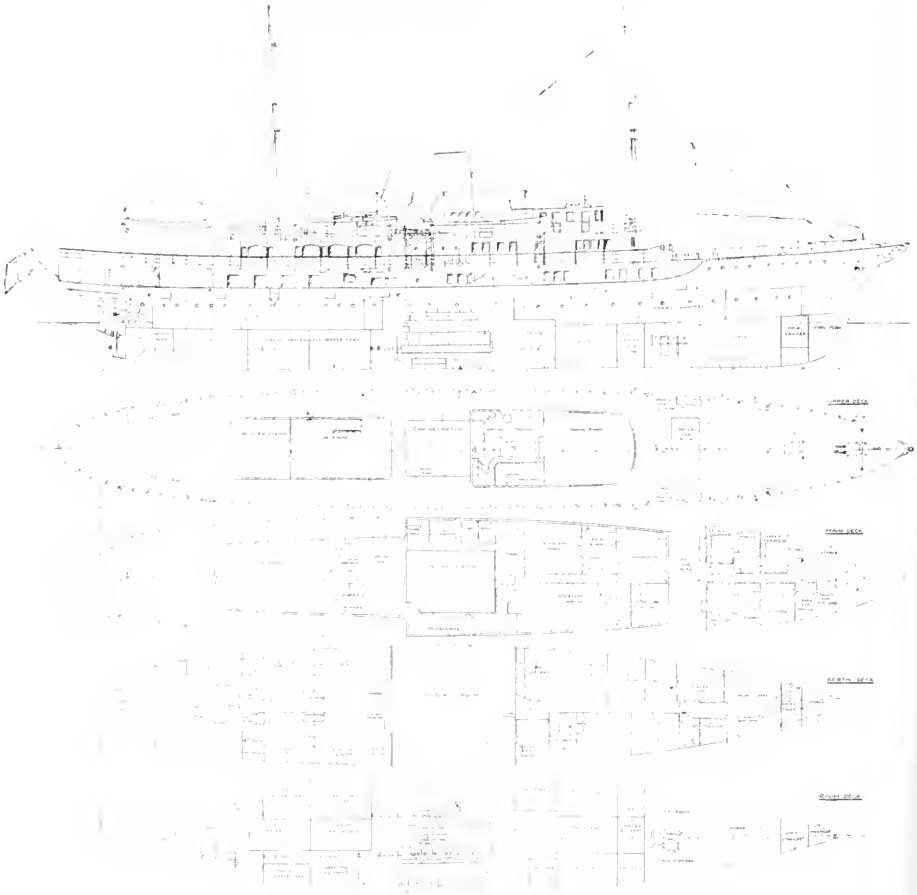
Particular attention has been given to the selection of carpets, rugs, curtains, hangings, and upholstery and to the arrangements and design of special electric lighting fixtures, so that the appearance and convenience throughout will compare favorably with those of the best modern hotels.



Broadside view of the Southern Pacific Company's steamer Bienville just before

LARGEST AMERICAN DIESEL ENGINE YACHT

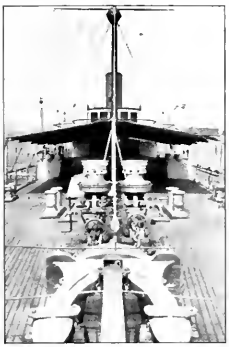
Fine Seagoing Motor Cruiser Designed by Cox & Stevens of New York, as a Millionaire Home Afloat for C. K. G. Billings of New York and Santa Barbara



Shadow profile and deck plans of C. K. G. Billings' motor yacht Vanadis.

VANADIS—THE SEA LURE

Comes now the calm eyed Freyja
Hight by the Latins *Vanadis*
Borne of the south wind
Melting the ice floes
Stirring the hearts of the Vikings.



Looking aft from the bow of Vanadis showing ground tackle gear stowed in shipshape fashion. Photo by Levick.

THROUGH the courtesy of C. K. G. Billings, representatives of Pacific Marine Review were privileged to inspect his beautiful yacht Vanadis on the occasion of her recent stop in San Francisco harbor. This vessel, the largest diesel-powered yacht ever built, was designed by Cox & Stevens of New York and built and engined at the Krupp plant, Kiel, Germany. She is now on an extended cruise as the floating home of her owner, his family, and guests.

The principal characteristics are: 240 feet over-all length, 210 feet water-line length, 35 feet beam, 14 feet draft. She is driven through twin screws by two Krupp diesel engines of 825 horsepower, each at 230 revolutions a minute. These engines are of the 6-cylindrr, 4-cycle, trunk piston, direct reversing type with cylinders of 18-inch bore and 25-inch stroke. At full speed and power they can drive the Vanadis at a little better than 15 knots. Ordinarily they are run so as to give a cruising speed of $12\frac{1}{2}$ knots, and at this speed she has a cruising radius of over 12,000 miles.

In addition to the main engines, there are three auxiliary diesel engines driving electric generators. Two of these are of 120 horsepower capacity, 4-cylinder, 4-cycle, and the other is a 60 horsepower, 2-cylinder, 4-cycle. One semi-diesel engine of 5 horsepower is installed for working the auxiliary air compressor.

The Vanadis was designed as an elegant, comfortable home afloat. As will be seen from the illustrations showing interiors, her rooms are on a very large scale. On the boat deck superstructure there are two sun rooms, one entirely enclosed and the other open aft. The enclosed sun room is finished entirely in natural East India teak. The dining room, living room, and all staterooms are finished in white enamel. In both the staterooms and the living rooms one gets the impression of a supremely elegant and tasteful home. This effect is greatly heightened by the use of a number of very valuable and very fine old paintings from the famous collection of the owner.

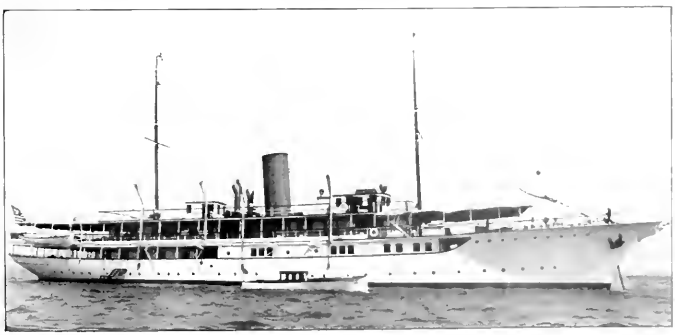
There are six guest staterooms in addition to the owner's suite and that of his wife. Each of these staterooms will accommodate three on individual beds and each of them has its attached tiled bathroom. A duplex ventilating system changes the air in each room every six minutes and is arranged for warm air in winter and cool in summer, as desired.

It will be noticed from the picture and plans reproduced herewith that the Vanadis is built for sea work. She has already proved herself a very steady, staunch, seaworthy craft in all weathers. With the patron goddess of the Scandinavian Vikings at her prow, Vanadis should be readily able to follow the discoveries of all the great explorers and captains of the past, as laid out on the medieval coastal chart of the world which forms the chief decoration in her beautiful entrance hall.

Sperry Stabilizer Installation

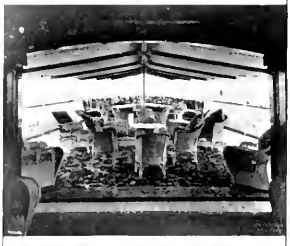
But steadiness and seaworthiness do not always make for comfort at sea, and so Mr. Billings has wisely added to her equipment a Sperry gyroscopic stabilizer, whose $12\frac{1}{2}$ ton rotor spun by an 80 horsepower motor at 1400 revolutions a minute and controlled by a 40 pound gyro, spinning 6000 revolutions a minute, holds the Vanadis down to a 2 per cent roll in any weather yet encountered. Without the gyro in operation she rolls easily to 20 degrees and has been observed to go 35 degrees.

This stabilizer has done more than any other one piece of equipment on the Vanadis to give the owner



Motor yacht Vanadis at anchor in San Francisco Bay. Photo by Swalley

The coastal chart of the world inscribed with the history of exploration and discovery which adorns the forward bulkhead of the main lobby of Vanadis.

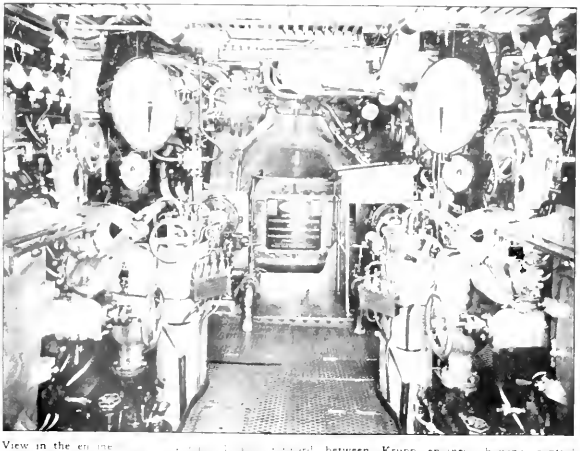


perfect satisfaction with the whole job, and the crew all speak very highly of its efficiency in keeping the boat on an even keel and in helping to maintain the course and speed in all weathers, as well as making things easy for the steering control and minimizing strains on the hull structure. Stabilization by the Sperry apparatus gives assurance of minimum damage to the valuable furnishings and equipment.

Ray Galley Range

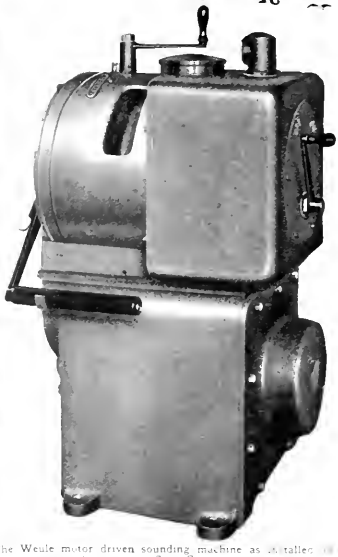
It will be interesting to American shipbuilders and manufacturers of marine equipment that some of the European installed apparatus on Vanadis has not given satisfaction and is being replaced by American built fittings and machines.

Among the latest equipment features is the 8-foot, 3-inch oven Ray portable steel oil burning range, which was installed in the galley of Vanadis after her trip across the Atlantic. It happened that the owner of the yacht was not acquainted with the merits of the Ray equipment



View in the engine room [illegible] and between Krupp engines showing control stand and [illegible] All photos on this page by Lesick.

View in the galley of Vanadis showing the Ray portable steel oil burning pumps.

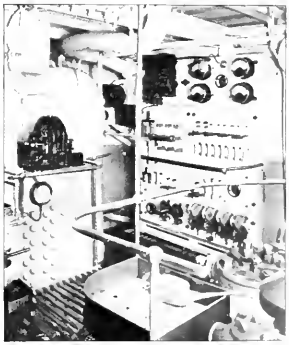


The Weule motor driven sounding machine as installed in Vanadis at San Francisco.

until the eleventh hour, and this necessitated shipping the range three thousand miles across the continent by express, from San Francisco to the Atlantic Coast. It is gratifying to receive such hearty endorsement of Pacific Coast designed and built apparatus from a source to which the pick of the world was open, and we congratulate W. S. Ray Manufacturing Company on having made this installation.

Weule Sounding Machine Installed

Another noteworthy San Francisco product installed on the Vanadis during her stop in San Francisco harbor and replacing a European device is the motor-driven sounding machine manufactured by Louis Weule Company. This machine was installed on the bridge deck, just aft of the after mast. It is a simple, efficient device controlled by one man with one lever, and is capable of securing accurate depth soundings every three minutes, where the old style hand operated machine required no less than 15 minutes' time and the services of three men.



The small Sperry control gyro which actuates the efferts of the gyroscopic stabilizer and the switchboard for control of the stabilizing apparatus.

A notable feature of the Vanadis is the number and variety of her small boats. These consist of one 37-foot Speedway sedan launch, one 30-foot Speedway power owner's launch, two 28-foot raised deck cruisers with Scripps engines and two 28-foot sail and power German-built life boats with 10 horsepower motors.

PRESENT PRACTICE AS REGARDS APPLICATION OF POWER FOR MARINE PURPOSES IN AMERICA

By WILLIAM T. DONNELLY, Consulting Engineer

This article is an abstract of a paper presented to the World's Power Conference in London.

William T. Donnelly has for many years been recognized as one of the foremost designers of marine terminal and drydock structures and has always taken a keen interest in and made a special study of the application of power for marine propulsive purposes. It will be noted that in his conclusion he prophesied a much broader application of diesel-electric propulsion on shipboard, particularly for short routes and coastwise traffic. This has been the editorial position of Pacific Marine Review for some years, and we are very glad to have it confirmed by such an authority.

THE past twenty years have added greatly to the application of the subject.

At the beginning of that period it would have been necessary simply to describe the application of steam power through the multiple expansion reciprocating steam engine. At the present time we have to consider the following seven divisions of the subject:

(1) Steam power as derived from the multiple expansion direct acting steam engine;

(2) Steam power through the direct application of the steam turbine;

(3) Steam power as applied by the steam turbine through operation of reduction gears;

(4) Steam turbine power operating through electric generators and motors;

(5) Application of diesel power direct to the shaft;

(6) The application of diesel power through generators and motors comprising the diesel-electric drive;

(7) Application of diesel-electric power distributed from a single vessel to a number of others in convoy.

The final selection of the power plant involves many considerations, some of which are entirely aside from engineering, and this paper more or less attempts to summarize some observations and personal conclusions on present day practice in the marine division of power development.

Ship Propulsion by Reciprocating Steam Engines

The marine steam engine is still with us—indeed, generates in the aggregate the greatest amount of power vessels at sea in combination with its old friend the Scotch boiler. The history of progress in engineering shows that no practical workable device is ever absolutely discarded. As Robert Dollar says, "A good triple and a few Scotch boilers are still a good combination to send away in a ship."

Direct Acting Steam Turbine

Application of this prime mover of ships was brought about by the demand for power units of far greater capacity than our experience with the reciprocating engine. In their first application, we took a backward step in over-all economy. Experience in expenditures in overhauling and replacements of turbine parts is no encouragement for extended application. The application of steam turbine through reduction gears is the logical engineering effort to retain low weight and high economy of fast moving turbine plants with high economy of slow moving propellers. With gears it is entirely practical to select more desirable propeller speed. This, however, is no sooner done than the reduction gear commences to talk back and engineers have had considerable study and are now just beginning to learn the language of the gear, and it is now certain that at a number of American manufacturing plants reduction gear units for marine work can be built for any desired output with reliability and satisfactory over-all economy. It is recommended to engineers that they investigate carefully the stresses introduced into a marine propulsion shaft "when attempt is made to stop and reverse its direction while the ship is continuing to move under practically full headway, bearing in mind that during the continuance of the progress of the ship such progress converts the propeller into a prime mover returning through the shaft the amount of power previously delivered to it, reduced only by its normal losses as a propelling device."

Direct Electric Drive

Troubles with original gear reduction units directed the attention of engineers toward reducing the speed by use of electric machinery. No one seemed to understand the language of reduction gear, but nearly everyone claimed to understand electric language and entered loud protest against the introduction of generators and motors to bring about such a simple result. A few engineers, however, persistently kept up the efforts. Due largely to the enthusiasm and persistence of W. L. R. Emmet of the General Electric Company, the turbo-electric drive has become a practicable proposition for the many marine purposes, as is shown through its adoption by the United States government for the propelling machinery of superdreadnoughts.

Direct Diesel Drive

The practical questions of this application, which in the beginning were of so serious a nature as to absorb the energy and capital and to defeat most of the individuals who had endeavored to conquer it, have now been overcome and the present status of the application of direct diesel power to marine propulsion is one of the great triumphs of engineering perseverance and ability.

Naval architects in the United States now have a choice of a number of reliable diesel engines of large capacity both in designs which are strictly American and in designs which have previously been developed in England and Germany. The direct diesel drive is particularly adapted for overseas inter-continental

transportation as applied to cargo ships and "more particularly to those designed for specific bulk cargo, such as oil, coal, lumber, or grain."

This very brief abstract brings us to the consideration of the diesel-electric drive. The development and the application of diesel-electric power may be said to be almost entirely in the hands of the naval architect and consulting engineer, as this drive is brought about by a combination and application of well standardized mechanical devices previously developed and perfected for other purposes. Its introduction made an unanimous protest from operating men afloat, and progress to date has been accomplished in the face of continuous opposition.

Applied at first to pleasure yachts, for which purposes it is eminently satisfactory, there has been a gradual spread of this drive to commercial craft. The primary objection is usually first cost, which "is probably the least important objection to be considered from an engineering and historical point of view." One of the recent notable applications is that on the four seagoing dredges for the United States government with three 1000 brake horsepower diesel engines. (Complete description of power plants on these vessels will be found in the August issue of Pacific Marine Review).

Another objection to both direct diesel engine and diesel-electric drive is excessive weight. "Investigations of reciprocating parts and weights in small internal combustion engines have shown the possibility of reducing pressure upon the main bearing to one-quarter by careful counterbalancing of the crankshaft and these reciprocating weights." This balancing will also enable the designer to increase by a considerable percentage the practical running speed, which is now limited by vibrations set up by unbalanced parts. It is practically certain that considerable improvement in the weights is possible in this direction.

On every count the electric motor is a better prime mover than the reciprocating or turbine steam engine. As a means for transmitting power nothing yet used compares with electricity. Analyzing, therefore, we have in the diesel-electric drive at one end of our system "the device which develops mechanical energy from fuel with the very highest thermal efficiency known. We have as our intermediate means for transmitting this energy the most flexible and best adapted medium. We can retranslate this transmitted energy into mechanical energy at any predetermined number of revolutions, using the best and most efficient device yet developed for this purpose. It would therefore appear that the most promising field for the development of tht art of ship propulsion would be to study and broaden the application of diesel electric power to marine transportation.

This would only be the beginning of the study of electricity as a transmitting and distributing means for mechanical power as applied to marine transportation and other purposes afloat. No sooner had the direct application of the diesel power to ships been brought about than the question of auxiliary power for cargo winches, pumping and lighting and all other purposes afloat became an important question and almost invariably this power took the form of a separate diesel engine for generating and distributing electricity for all auxiliary power purposes, with the result that not only our leading electrical corporations but leading shipbuilding corporations have taken up the problem and are developing special electric motors and other electric power appliances particularly adapted to work aboard ship.

All of these developments direct the attention of the engineer who is looking at all broadly at the problems of marine transportation to consider if we have not arrived at the point where the generation and use of power afloat is not going to be separated and made two distinct functions, the same as upon the land—that is, are we not going to have aboard ship power generating and distribution entirely separate and distinct from power application and use—the first in the hands of an engineering staff, and the second in the hands of an executive staff?

Shallow Water Transportation

Before closing, the author would like to make some general reference to shallow water navigation in which will be included the navigable waters of harbors, rivers, and lakes.

The enormous increase of land transportation is congesting our railroads and terminals, and the ever increasing value of land is enormously increasing the cost of the extension and betterment of this service. On the other hand, comparatively little or no development has been made in the use of our shallow waters other than that of the Great Lakes, which curiously enough indicates what the possibilities of such a development might be, as it is well known that we have upon the Great Lakes a greater tonnage in proportion to their area than anywhere else in the world, that we carry cargo for a lower price per ton mile, and that we load and unload a vessel in a shorter time than anywhere else in the world, and all of this in spite of the fact that we are there limited to a maximum draft of 21 feet, and that over the main lines of transportation two-thirds of the total freight moves in one direction, which means that one-third of the ships carry cargo in both directions, and as an extra handicap upon all of these the lakes are closed to navigation for between four and five months in the year.

Application of Diesel-Electric Power Distributed from a Single Vessel to a Number of Others in Convoy

As a final contribution of a personal nature the author begs to submit the outline of diesel-electric packet dispatch for inland waters. This system of marine transportation, which at present only exists in the form of a demonstration plant, contemplates a diesel-electric power plant afloat from which propelling power will be distributed not only to the power vessel itself, but to other cargo carriers in convoy, by means of waterproof electric cable. The power so conveyed is to be for propulsion and all other purposes, such as refrigeration of cargo, lighting, cargo handling, etc. In the demonstration plant referred to two small vessels were fitted out and propelled from a source of electric power on one of them. The power vessel in this instance was astern, power being delivered over the bow by flexible cable, which came aboard over the stern of the leading boat, and supplied not only power of propulsion, but electricity for lighting, heating, cooking, and all other requirements for the author and his family on a trip through the inland waters of the Atlantic Coast from New York to Florida and back, not once but on two succeeding years. Other trips were made in northern waters along the Atlantic Coast and up the Hudson River through the New York state canals to the Great Lakes and return, a total distance of more than 8000 miles.

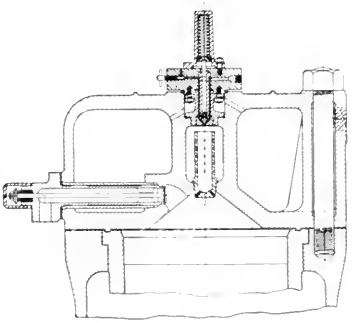
While the possibilities of this broad application of diesel-electric power to marine transportation for inland waters are all in the future, it is submitted as something to look forward to.

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

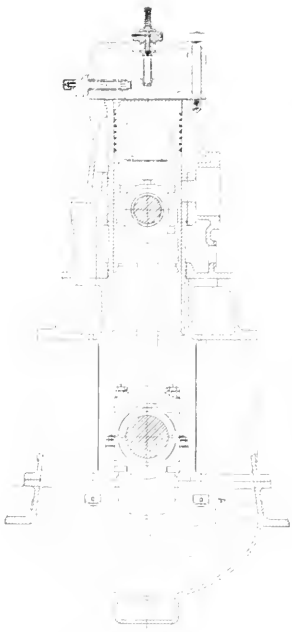
BETHLEHEM-TROUT HEAVY OIL ENGINE

THE Moore plant of the Bethlehem Shipbuilding Corporation, Ltd., Elizabeth, New Jersey, is now manufacturing in sizes ranging from 50 to 480 brake horsepower a heavy oil engine, the design of which is based on that of the engine formerly built by H. G. Trout Company, Buffalo, New York.

The Trout engine for a number of years has been in successful operation in many plants afloat and ashore in the Great Lakes region. Important changes have been made in the design, and the improved engine is now being placed on the market in a form especially adapted to the propulsion of tugs, ferryboats, barges, lighters, and yachts, as well as to the driving of generators, pumps, and machinery.



Section through the head of the Bethlehem-Trout heavy oil engine, showing fuel valve and method of combustion.



Vertical section through cylinder of Bethlehem-Trout heavy oil engine.

The engine, as will be seen from the illustrations accompanying this article, operates on the two stroke cycle with port savenging.

The Leissner system of fuel injection is used, in which a separate fuel chamber for each engine cylinder is driven from the engine crankshaft and forces the exact amount of oil for each stroke to the fuel spray valve in the cylinder head. From this valve the oil is sprayed into pre-combustion chamber, as shown in the small illustration.

The air on the compression stroke of the engine piston is compressed to 450 pounds per square inch, heating the air in the pre-combustion chamber sufficiently to ignite the oil. This pre-combustion sets up a higher pressure in the chamber, driving the gases and unburned oil through a perforated tube into the main combustion chamber, where it mixes with the main charge of hot air and, continuing to burn, produces the power stroke. The rate of combustion and the maximum pressure are controlled by the rate of injection of fuel through the tube in such fashion that combustion in the cylinder follows the true diesel cycle.

The Bethlehem-Trout engine is simple in construction and operation, fool-proof, and should operate with a minimum of maintenance cost. There are no mechanically operated valves. Starting and reversing are accomplished by means of compressed air admitted to the cylinder through a control system simple in design and of unusual reliability.

The 3-cylinder, 75-brake horsepower Bethlehem-Trout engine, equipped with mechanical reverse gear and running at 350 revolutions a minute, has a total weight of approximately 12,000 pounds, or a weight per horsepower of 160 pounds. The 6-cylinder, 480-brake horsepower engine, arranged for direct reversing with compressed air, has a total weight of 72,000 pounds, or a weight per brake horsepower of 150 pounds.

NAVIGATIONAL INSURANCE

THE Kolster radio compass is to be immediately installed on board the steamships Yale and and Harvard, plying between San Francisco, Los Angeles and San Diego, purchase contracts having been closed between the Los Angeles Steamship Company and the Federal Telegraph Company, sole owners and manufacturers of the compass.

This is considered a wise and farseeing move on the part of the Los Angeles Steamship Company, as the Kolster radio compass insures their ships against disaster and the consequent loss of life and property. The ships will be able to determine their exact position in the densest fog. Passengers may sleep, eat, and enjoy themselves generally to their hearts' content, no matter how black the night, how dense the fog, or how threatening the weather.

The Kolster radio compass is considered by authorities and students of maritime affairs to be the greatest of modern inventions for the protection of lives and property at sea. It is also a great aid to ordinary navigation. It was invented and developed by Dr. Frederick A. Kolster of Washington, D. C., and San Francisco.

ONE HUNDRED YEARS OF ROPE

IN January, 1824, after a long contest and by a bare majority, a new tariff bill was passed through Congress, one of the clauses of which raised the duty on tarred cordage to 4 cents a pound and on untarred cordage to 5 cents a pound, and fixed the duty on unmanufactured hemp at $35 a ton.

At that time a very energetic, long-headed gentleman by the name of Bourne Spooner, who had been for some time manufacturing rope by slave labor at New Orleans, saw the opportunity of profitably manufacturing rope in his native New England and giving profitable employment to intelligent New England workmen. He accordingly returned to Massachusetts and organized a corporation to be known as the Plymouth Cordage Company.

It is interesting to note that at the first meeting of the directors, held at the counting house of John Dodd, August 6, 1824, Bourne Spooner was appointed as agent and was authorized to construct "a rope walk, wharf, storehouse, and other buildings, and to contract for machinery, tools, etc. He was authorized, at a cost not exceeding $1800, to erect a dwelling house for his own occupancy, the rental of which was to be $100 per annum, and his salary was fixed at $1100 per annum."

We have remarked above that Mr. Bourne Spooner was an energetic, long-headed gentleman. This is very aptly proven through a letter written by him to the president of the company, March 8, 1825, in which we note with interest the following sentence:

"We are now nearly ready for a beginning. I shall advertise cordage in the next 'Memorial' (the Plymouth paper) and make some within a fortnight, probably 20 tons or more next month if ordered."

We also note that among the first purchases recommended by him was a sloop, Hector, by means of which he took advantage of economical water transportation to Boston and other nearby coast towns.

The conditions of labor and the cost of food should also be of interest to our modern economists. Hand spinners were getting in 1825 $1.16 2 3 per day and common laborers were getting 83 1 3 cents. The day's work usually ran from sunrise to sunset with time out for breakfast and for lunch.

The prices of food were: flour, $6.25 per barrel; corn, $1 per bushel; white sugar, 18 cents per pound; common sugar, 10 and 11 cents per pound; butter, 19 cents per pound. Early in the 1850's, after a number of friendly meetings between the executives and the men, the hours of labor were put upon a more uniform basis and the average day showed about 11 working hours.

It is very interesting to consider as a side light on these labor conditions in early New England, that a man working as a common laborer could in those days greatly better his condition by going to sea on a Yankee sailing ship, especially if he were given an opportunity to do a small amount of trading on his own account.

The original capital stock of this corporation was $20,000. This was increased by small amounts at short intervals until March, 1826, when it had risen to $44,000. In 1883 the capital stock had been increased to $500,000 in five additional jumps, all of which were provided for by special stock dividends, so that each single share of stock as of 1826 had, by 1883, grown into 11 4 11 shares. Since 1832, it is said, that with the exception of three years one or more dividends have been paid every year, notwithstanding the fact that during the period in question on a number of occasions there had been serious setbacks by fire and by business panic. This dividend record covering so long a period of time speaks volumes for the conservative management of the corporation.

The relations between the executives of the Plymouth Cordage Company and the working personnel have always been very cordial. In the language of a man who had worked for this company for years and who recently had occasion to express his impressions, "For more than 40 years I have known the Plymouth Cordage Company and have enjoyed the friendship of many of its employes. Many of them never did a day's work elsewhere, and at the present time more than a dozen of my friends have worked with the company more than half a century. I knew them first as boys and young men. I worked with them, for I, myself, have worked for the Cordage, and the impression I received on the first day, and which continued always, was the attitude of the men who made the rope. I had interest in my work, a pride in the product, a belief that the best possible fiber was always purchased, and that no process in the construction of a rope should be neglected. This idea, carried out with complete loyalty, throughout the entire organization, has always been behind Plymouth Rope. I know it is there today. I can have no doubt of the character of the rope produced, of the character and ability of the men who make it, and can but admire the purpose and ability of the old leaders who created this spirit and of the present leaders who keep it alive."

GYRO-COMPASS WIDELY USED

NAVIGATION has advanced quite rapidly in the last ten years due to the introduction of the gyro-compass. Being nonmagnetic it can be relied upon regardless of type of vessel or nature of cargo. Many important auxiliaries controlled by the gyro-compass, such as the gyro-pilot, course recorder, radio repeater, etc., have, in the last two years, followed the gyro-compass in use on merchant vessels.

City of Los Angeles, Los Angeles Steamship Company.

Olympic and Homeric, White Star Line. Installations being made in Southampton, England.

Henry Ford II and Benson Ford, Ford Motor Company, Detroit.

The Italian freighter, Vallemare, was equipped with a gyro-compass during her recent stop at Montreal, Canada.

The Japanese Government Railway Ferries for service across the Tsugaru Straits — the Steamship Matus Mayo Maru and Tsugaru Maru—are employing the gyro-compass for the first time.

In this country the Elisha Walker, of the Pan American Petroleum Company, the F. W. Weller and F. Q. Barstow, of the Standard Oil Company of New Jersey, the George Washington, of the United States Lines, and the President Wilson of the Pacific Mail Steamship Company, have been equipped with gyro-pilots, these vessels having for some years enjoyed the advantages of the gyro-compass.

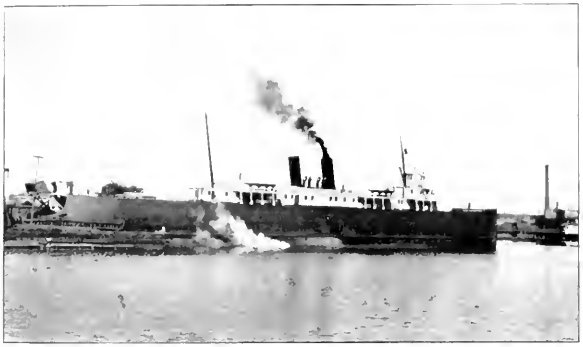
GREAT LAKES CAR FERRIES

THE Manitowoc Shipbuilding Corporation, Manitowoc, Wisconsin, has recently completed one very interesting steel twin screw steam car ferry for the Pere Marquette Railway, and is now completing a second car ferry of the same dimensions.

These vessels are to be used in cross-Lake service on Lake Michigan between Milwaukee and Manitowoc, Wisconsin, and Keewanee and Tudington, Michigan. The completion of these two ships gives the Pere Marquette Railway a fleet of seven ferries on this service.

The two new ships are alike in every particular and have the following dimensions:

Length over-all	360′ 0″
Length between perpendiculars	348′ 0″
Beam molded	56′ 0″
Depth molded to main deck	21′ 6″
Depth molded to spar deck	28′ 10″



Two views showing the cross-lake car ferry Pere Marquette No. 21.

The vessels are built entirely of steel and are made of extra heavy sections and plates to withstand ice pressure, since they are expected to operate all year round. The main deck has four tracks with a total capacity of twenty-six 42-foot 100-ton freight cars. Twenty-eight ordinary cars can be carried.

The power plant consists of four coal-fired Scotch boilers, each 14 feet 6 inches by 11 feet no inches. These supply steam to two triple expansion engines, the cylinder dimensions being $20\frac{1}{2}$ inches by 34 inches by 56 inches, and 36-inch stroke. This plant generates 2800 horsepower and drives the vessel at a service speed of 15 miles.

As will be noted from the pictures, these ferries present a very shipshape appearance with their black hulls, white houses, black stacks and masts. The two vessels are known as the Pere Marquette No. 21 and the Pere Marquette No. 22, and No. 22 is at the builders' outfitting wharf.

UNUSUAL SERVICE RECORD

JOHN L. WHITING-J. J. Adams Company, the oldest brush manufacturers in the United States, recently took out group life insurance for their employes, and in examining the employment records of the company uncovered some interesting facts about a large group of their men and women workers.

Long service in one company is the exception rather than the rule in these days of expensive labor turnover, and in the field of skilled labor such service records are invaluable to the employer. Business executives are concerned today with the problem of labor turnover and the lessening of its cost in money and production loss. The unusual number of long-time employes in the Whiting-Adams brush factory may perhaps be interesting both as living statistics and as proof that conditions which hold employes over a working lifetime can and do exist.

Whiting-Adams have been making fine brushes for over 116 years. Successful methods have been handed down through four generations of practical brushmakers. It has been a family business, starting with the founders, John Adams and Seth Whiting, and coming down to the present management. The men and women who have worked for it have been made to feel that they were members of the family. Their records show that they have felt themselves to be such.

Eighteen Whiting-Adams employes have been with the company over forty years. Of these, seventeen are men and one is a woman.

4 for 46 years.
1 for 45 years.
4 for 44 years.
5 for 43 years.
2 for 42 years.
2 for 41 years.

Other groups with notable service records are:

12 for over 35 years.
8 for over 30 years.
15 for over 25 years.

making a total of fifty-three men and women who have worked for one company more than a quarter of a century. One hundred and ninety employes have been with Whiting-Adams over five years. None of the older group could get new insurance at their present ages, but they now have policies which cannot be cancelled by the insurance company and which will be paid for by the Whiting-Adams company as long as they remain on its payroll.

It is believed by the officers of the company that this protection is merited by the long period of faithful service, and it is in line with the policy of the company to continue to act as one big family—working for one another's good, employer and employe alike.

SILENT HOIST CAPSTANS AND WINCHES

THE illustrations accompanying this article show an interesting line of capstans and winches for deck and dock use designed and manufacturer by the Silent Hoist Company of New York. The Silent Hoist electric capstan is driven by a self-locking, non-reversible, worm gear drive consisting of a phosphor bronze worm wheel meshing a nickel steel worm, hardened, ground, and polished, mounted on radio-thrust ball bearings, all running in oil, in an enclosed gear case.

The non-reversibility of the worm gear drive makes it an absolutely safe machine, not requiring old fashioned pawl and ratchet to prevent backward turning should the motor stop due to failure of the current, or otherwise.

The winch head is also machined all over and polished to prevent wear and tear of the rope and is fitted with a bronze cover plate. The entire outfit is simple, safe, strong, and weatherproof, a sheet steel housing being furnished enclosing the motor.

This vertical capstan is furnished in two sizes; the model "T" which has a winch head 6¾ inches in diameter by 12 inches high, and has a capacity up to 5000 pounds pull on a single line; and the model "GT" which has a winch head 10 inches in diameter by 15 inches and has a capacity up to 10,000 pounds pull on a single line.

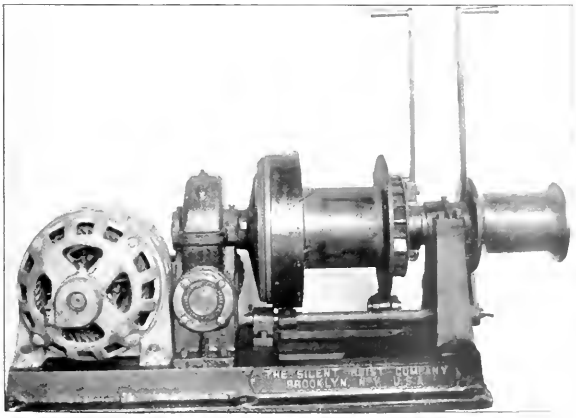
The Silent Hoist winches, both double and single, also have the same non-reversible worm drive with which the capstans are fitted. This feature is particularly valuable in its safety features in handling cargo.

A Silent Hoist "AA" double drum winch driven by 60 horsepower gas engine in action on board the motorship Teco of the British Columbia Cement Company, Vancouver, B. C.

The Silent Hoist equipment is compact, simple and self-contained. It is especially adaptable for pulling and spotting cars, pulling and snaking barges, and general hoisting and pulling work on docks and at freight terminals, and aboard ship.

A number of interesting installations have been made on shipboard on the Pacific Coast. Notable among these are the Canadian motorship Teco of the British Columbia Cement Company of Vancouver, B. C. A model "AA" double drum Silent Hoist winch driven by a 60 horsepower gasoline engine has been in very satisfactory service on the Teco for six years.

American motorship Casco of San Francisco has a similar installation of a model "BB" double drum winch driven by a 20 horsepower gas engine giving excellent service.



A single drum electrically driven Silent Ho

NEWARK WIRE CLOTH COMPANY IN NEW QUARTERS

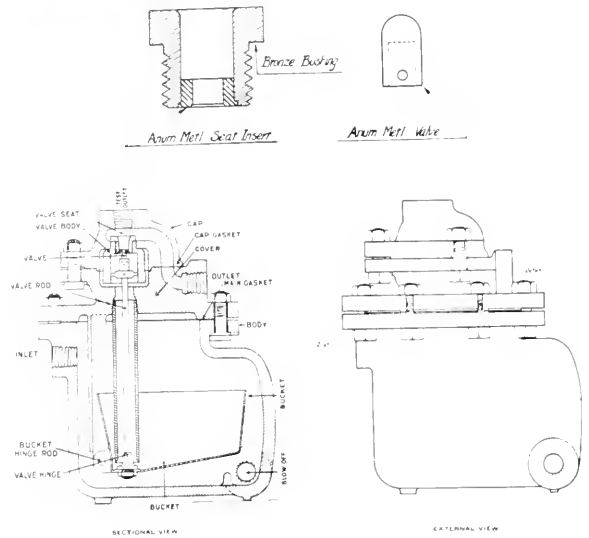
ANNOUNCEMENT is made by the Newark Wire Cloth Company that they are now established in their new plant at 351-365 Verona avenue, Newark, New Jersey. The new building is 100 feet wide by 310 feet long, covering approximately three-fourths of an acre in floor area.

Newark wire cloth has always been known principally as a quality cloth, the reputation of its manufacturers having been founded on quality and unusual fineness of mesh. There is no question but that this consistently high grade of cloth has been largely responsible for their outgrowing the old plant and has forced them to build new quarters.

In addition to building new machinery the Newark Wire Cloth Company recently absorbed an old and well known eastern wire cloth manufacturing concern, installing the machinery so acquired in the new building. As a result they are now able to make their high standard of metal cloth in larger quantities than ever and it is believed that for some time they will be able to meet all demands for their high grade of cloth. Testing sieves, metallic filter cloth, foundry riddles, sifter cloths, and straining cloths will briefly cover their products.

In the new plant Newark wire cloth is now being made of all metals such as aluminum, brass, copper, bronze, silver, gold, platinum, phosphor bronze, nickel, steel, monel metal, nichrome, and special alloys, and they are making all meshes from one space to every 2 inches to 325 meshes to an inch.

Not long ago this company developed a special filter cloth known as the "Newark" Metallic Filter Cloth which has a double surface, is extra strong and durable and is made with a spiral overlap.



Vertical section elevation and details showing the construction of the Strong steam trap.

Strong Steam Trap

A GOOD steam trap must combine four very important essentials: simplicity in construction, facility of inspection, long life, and efficiency in steam saving. As will be noted from the accompanying drawings, the Strong Steam Trap, manufactured by the Strong, Carlisle & Hammond Company, Cleveland, Ohio, fulfills these requirements very admirably.

In this trap there are practically only two wearing parts; namely, the valve and the valve seat. For efficient service and for accessibility, these are placed at the top of the trap entirely removed from any direct scale or sediment with which they might otherwise come in contact.

In all Strong steam traps for standard and high pressures, the valve and the valve seat are made from "anum metl," which is practically indestructible, and these parts are guaranteed to stay tight for one year's service, or to be replaced without charge by the manufacturers.

The trap is designed with a minimum of working parts and with all metal sections, having ample factor of safety and sufficient rigidness to withstand any of the abuse which such equipment is liable to get under marine conditions.

Many installations have given continuous satisfactory performance over long periods of time in very difficult working conditions.

INSTALLATIONS OF THE LUX SYSTEM

THE August issue of Pacific Marine Review carried a complete description of the method of extinguishing oil tank fires by liquid carbon dioxide, featuring a patented method known as the Lux System.

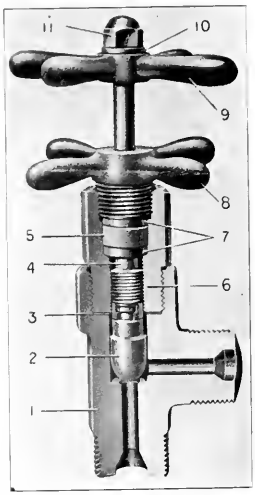
E. S. Hough, consulting engineer and representative of Walter Kidde & Company of New York, distributors of the Lux System in the United States, informs us that this system of liquid carbon dioxide has been installed on the Standard Oil tanker J. H. Senior; Standard Oil barge No. 7; the motorship Lassen; motorship Admiral Peary; motorship Casco; motorships William Penn, Challenger, and Prometheus; the diesel-electric dredges A. MacKenzie, Dan C. Kingman, and Rossell; and the diesel-electric lake and canal freighters Twin Ports and Twin Cities, as well as on many Norwegian and Swedish motorships.

NEW TYPE VALVE FOR OXYGEN MANIFOLDS

A SATISFACTORY valve for an oxygen manifold, which must necessarily carry very high pressures, has always been a problem. The Oxweld Acetylene Company, however, after a study of several different designs, has developed a valve that meets every requirement. It has a swivel tip on the stem. The cross-sectional illustration shows the details of its construction and operation.

The body (1) has a formed seat receiving the stem tip (2). This tip is attached to and carried by the stem (4), by means of a swivel joint. Thus the tip is enabled to seek its own natural seat in the body. The stem screw is in the inner end of the stuffing box (6), which is made gas tight into the body by means of the lead gasket (3). The stem itself is made gas tight by the rubber packing (5), which is compressed between packing rings (7), by means of the hand wheel and nut (8).

This new valve is absolutely foolproof. If the operator should happen to unscrew the hand wheel all the way, there is no possibility of the internal parts being blown out by pressure, because the stem screws into the stuffing box. Even if he should unscrew both the stem and the hand wheel, the parts could not come out because the large end of the stem would lodge against the inner end of the stuffing box.



CONSTRUCTIVE PUBLICITY

How to Order Brass. This is a 40-page booklet in brown cardboard with gold stampings, profusely illustrated, published by the Chase Metal Works, Waterbury, Conn.

The business of casting and working brass is of very ancient lineage, the earliest literature of which we have knowledge refers to extensive working of brass by hand and furnace. On account of its history, a great deal of indefinite trade terminology has grown up, much of which still appears in engineering specifications and in orders issued by engineering authorities, so that many complications have arisen, causing delay and expense in the carrying on of structural work.

The purpose of the book under review is to point out the properties in brass, bronze, and nickel silver desirable for typical uses and to give instructions for ordering such materials, so that the manufacturer will understand exactly what is wanted. Unless the brass mill understands definitely the exact alloy, the temper, and the gauge desired it cannot be expected that the order will be filled to the satisfaction of the customer. This sounds simple, but is far from it in practice. There are literally hundreds of alloys in actual use under the general classifications of brass, bronze, and silver nickel. Professor W. Campbell lists about 1500 non-ferrous alloys, of which nearly 700 fall under these classes. The possible combinations would, of course, run into the thousands.

Brass is an alloy composed mainly of copper and zinc, to which other metals are added, such as lead, tin, iron, manganese, phosphorous, or

The Offices of the Chase Company, Waterbury, Connecticut

combinations of these in order to give special properties; lead in small quantities for machining properties; iron for strength and hardness; tin for resistance to corrosion; manganese and phosphorous as deoxidizers.

Bronze is any alloy of copper and tin containing over 50 per cent copper. Wrought bronzes usually contain at least 88 per cent copper.

Nickel silver is any alloy of copper, zinc, and nickel, the common range being 50 to 70 per cent copper, 5 to 30 per cent nickel, 15 to 40 per cent zinc.

The booklet closes with a table listing the common mill names, typical uses, and temper usually required for such uses for all of the more frequently used copper alloys.

It is very important that the correct term be used in specifying the temper as well as the alloy in brasses. The terminology generally used is light anneal, drawing anneal, and soft drawing anneal, corresponding to the older terms of blued, blued soft, and soft. This set of terms is used for material finished by annealing. For material finished by rolling, the terminology for temper is arranged according to the reduction in B and S gauge numbers, as shown by the table herewith. In the absence of instructions brass is always annealed suitable for drawing.

For tube tempers the usual designations are half hard and hard, corresponding to the same tempers for rolled sheet.

Rod material is usually finished either by annealing, in which case the temper is always soft, or drawing, which gives two tempers, drill or hard. Rod is usually finished drill temper, which corresponds to a reduction in temperature of from 5 to 10 per cent, and wire is either finished by annealing to a soft temper or by drawing, in accordance with attached table.

The Chase companies have made very careful study of the use of brass and are in a position to give expert advice and make exhaustive analyses of all ordinary and special uses of the materials that they handle, and it is highly advisable that this service be used by customers before placing orders for large quantities.

The book, "How to Order Brass", may be obtained on application from any of the Chase offices.

The factory of the Chase Company, Waterbury, Connecticut

LUBRICATION ON SHIPBOARD

An Open Forum—Questions on Lubrication Problems are Invited; They will be Answered in Order of Receipt

INSTALLMENT No. 3

Question No. 12.—What is the best type of oil to use in Kingsbury thrust and Mitchell bearings?

Answer.—The Kingsbury and Mitchell types of marine thrust bearings require a good steam turbine oil of not over 300 to 400 viscosity at 100 degrees Fahrenheit for successful lubrication. The thickness of the oil film is often less than 0.0001 inch and the use of heavy viscosity oils or compounded marine engine oils is not advised for the above reason, and also that the internal fluid friction in the oil is considerable if thick gummy oils are employed. Light oils rapidly circulated pick up and carry away the frictional heat, and thrust bearings are always operated cool on light or medium oils.

Question No. 13.—In the section for August, under the request to discuss lubrication of marine diesel engines, I note that you say that valve stems should be lubricated with kerosene or cylinder oil cut back with kerosene to prevent gumming on valve stems. Would like to know if valve stems are ever lubricated solely with kerosene or whether kerosene itself has any lubricating quality.

Answer.—Valve stems on marine diesel engines or any other form of internal combustion engines carry a very high temperature and when straight cylinder oil is employed by hand oiling for their lubrication, the surplus oil burns and causes gumming and forms carbon and produces excessive friction. Kerosene cuts such deposits and keeps the stems and guides clean. Kerosene itself has practically no lubricating qualities and its use on valve stems is not primarily for lubrication, but for the purpose above mentioned. The best of engineers and operators do not always agree on all subjects, but the writer is of the opinion that after grinding valves the stems should be thoroughly rubbed with powdered graphite mixed with oil, and lubrication of the stem used sparingly. If too much kerosene is used and any considerable amount finds its way into the lubricating oil the viscosity and the oil flash points are bound to be lower and its lubricating value impaired. Vertical valve stems require much less attention than the horizontal type.

Question No. 14.—"What should be the specific gravity of a good lubricating oil for the guides, etc., on the thrust block and for the pins and crosshead?

Answer.—A good lubricating oil is a straight hydrocarbon oil compounded with a certain percentage of animal or vegetable oil. When compounded with water rapeseed oil is used and for this purpose a 6 oil on your [illegible] the oil to float on the body of water in which it is used. It does not dry on each stroke. The [illegible] is to expedite the greater the saponification [illegible] decomposed after it has been saponified it [illegible] your guides, etc., and cannot be [illegible] hot or cold, fresh or salt. It also [illegible] You have observed your slides are [illegible] it remains and when bright [illegible] look out for heat. This also is [illegible] If you will have your oiler shoot [illegible] fresh water on alternate rounds, [illegible] your oil consumption down and the [illegible] ut of your pins means that ever[illegible] ick substance spells trouble. Be sure [illegible] er in your wick feed lubricators [illegible] the oil will saponify and cease to feed. This holds good on all wick feeds. Compounded marine engine oil should under no circumstances ever be used in crankcase engines or turbines for reasons given above.

Mineral marine oil is a straight hydrocarbon oil without the addition of the compound and is used in mechanical feed systems on both steam and diesel engines.

Question No. 15.—What is Colza oil?

Answer.—Colza oil, as it is commonly known among marine men, is a burning oil used for bulkhead lamps in the engine and firerooms and other places aboard ship. Its use dates back before the advent of electricity and comes from the old English merchant marine. This oil consists of a 50-50 per cent mixture of mineral oil and cottonseed oil, or in some cases rapeseed oil, and is similar to the signal oil used on railroads. Real Colza oil is a local name given in some places to the product as first pressed from the rapeseed. This oil may be refined to produce a food oil, and after being blown with air is used as a compound for marine engine oils and also in other cases.

Question No. 16.—What is the rule for determining the amount of energy in heat carried away by the water in the oil cooler?

Answer.—To calculate the B. T. U.'s thus lost, find the quantity of water discharged by the cooler per minute. This weight in pounds, multiplied by the difference in temperatures between the injection and overboard discharge, will be the total B. T. U.'s lost per minute. Or to determine same by the oil method, first determine the amount of oil being discharged through the cooler per minute, multiply the weight of oil in pounds per minute by the fall in temperature in going through the cooler and by 0.5, which is approximately the specific heat of turbine oil. This result will be the B. T. U.'s carried away per minute.

Question No. 17.—In drawing off oil from the supply tanks on the dynamo, flat strings of soft dark colored heavy material often plug up the service cocks. It feels like gelatine and we remove it from the bucket with a paddle before [illegible] the daily supply tanks. Can you explain this?

Answer.—The question of oil storage is of great importance to a marine engineer. The flush plugs in your deck [illegible] be thoroughly clean before the funnel is inserted and the same holds good for the barrel that holds the oil, as foreign matter getting into the oil at this point is sure to cause future trouble. The funnel should be screwed into the fill hole and be provided with a screen. After filling the storage tanks with compounded marine engine oil, the run down pipe should be thoroughly cleaned out by flushing same with kerosene before attempting to pass dynamo oil through it.

I would suggest that you drain your tanks and thoroughly filter the oil through chee-scloth, then thoroughly flush out tank and wipe dry before refilling. The dark strings of ropey material you speak of is a sludge being composed of accumulation of impurities and water, and, if you have been receiving your supply in wooden barrels, it may be glue from the interior of the barrels, as all such containers are thoroughly glued up before being filled with oil. Inferior glues are soluble in oil.

A QUESTIONNAIRE

This new department of Pacific Marine Review is now called upon to discuss the lubrication of the diesel engine from the practical operating standpoint.

In the preparation of our notes we are glad to inform our readers that we have received assistance from consulting engineers, practical operating engineers, diesel engine manufacturers, and lubricating oil specialists.

We especially acknowledge the cooperation of the Associated Oil Company staff of lubrication and consulting engineers in the compiling of data.

MARINE INSURANCE

DEVELOPMENTS OF THE MONTH

By CHARLES F. HOWELL, Contributing Editor

BRAZIL has taken the spotlight as the scene of trouble for marine underwriters. From governmental sources comes the cheering word that the military revolt is well in hand, but the insurer takes the intelligence with a grain of salt. With military guards sitting in the telegraph and cable stations at Santos, Sao Paulo, and Rio de Janeiro and scrupulously censoring everything that goes on the wires, it is a very difficult thing to learn just how far the uprising has gone and what its effects have been to date. One thing is certain. Shippers are in a highly nervous state over the situation and are fearful of cargo congestion at all three ports. This is shown in their application to underwriters for additional cover; and they are wise in so doing.

Merchants cannot be told too often that under such circumstances as these the strikes, riots and civil commotions clause of their policies affords insufficient protection. That covers against the results of civil disturbances of a local character; not against a military uprising such as this is. Merchandise insured under the warehouse to warehouse clause is covered against policy perils while in the ordinary course of transit, and mere delay, therefore, will not void the protection. But if goods are to be protected against the acts of revolutionists—the dynamiting of stores, for example, or the derailing of trains—then additional cover must be had.

Coffee Coverage

Unfortunately underwriters are quite in the dark as to just what the conditions are in the disturbed section of Brazil, and so we find a considerable discrepancy in quotations: some are rated at $^1/_4$ per cent and some at $^1/_2$ per cent. The chief commodity affected by the disturbed state of affairs is coffee. There will doubtless be large accumulations of it at Santos, Sao Paulo, and Rio. In view of the fact that it is usually insured against country damage, it seems probable that underwriters will have to foot substantial bills for dirt and stain if much of it lies long on open wharves, in damp warehouses, or in sheds.

Early war risk quotations rapidly stiffened as news from Brazil increased in gravity. London shares the anxiety felt by American underwriters, as is shown in the issuance of rates as high as 5 per cent for a thirty-day cover against fire, strikes, etc., with the exclusion of the hazards of confiscation, seizure, etc. A similar rate has been going the rounds of the New York market.

In order to be prepared for the worst, a committee has been appointed by the American Institute of Marine Underwriters which shall make and issue minimum rates every morning for strikes, civil commotions, and war, applying to coffee from all Brazilian ports, and to all other merchandise to and from Brazilian ports. This committee is composed of Messrs. Roberts, chairman; Ebert, Elder, Purcell and Kaufman. An agreement is being circulated among the New York underwriting offices for signature, and it is agreed

At the left we have the bow of the American tanker Swift Arrow on the dock at the Robins plant of Todd Shipyard Corporation after her collision with the steamship Boston on July 21. At the right is shown the steamship Boston after this collision while undergoing repairs at the Tietjen & Lang plant of the Todd Shipyards Corporation. A feature of this collision was that all the casualties were due to the crushing of passengers in their staterooms. No access was possible to the victims until after the vessel had been towed to port. Had the vessel been equipped with portable oxyacetylene cutting apparatus immediate aid might have been rendered, some lives might have been saved, and certainly much suffering could have been avoided.

that in event of failure to secure complete accord power be given the committee to decide whether the recommendations shall be binding on the signatories, and that consent to the provisions of the agreement may be withdrawn by any of the signatories thereto upon the lapse of twenty-four hours after service of notice upon the secretary.

Court Upholds the Certificate

In view of the decisions by English courts that the insurance certificate is not a valid tender and may not be regarded as the equivalent of the original policy, it is interesting and encouraging to see that this is not the view of American courts and that usage is sufficient warrant. This important point was recently made by Judge Learned Hand in the United States District Court for the Southern District of New York, in the case of the Swedish State Railways vs. Dexter & Carpenter, Inc. His Honor held that the tender of an American broker's certificate as to the placing of marine cargo insurance in London, instead of a complete policy, satisfies the requirements of insurance in a C. I. F. contract.

The purpose of the demurrer was to secure a ruling consonant with those recent English cases under which such a certificate would not be a valid tender of insurance, and under which apparently even after acceptance substantial damages may be recovered. The contract did not prescribe a policy of insurance, but left the obligations to be determined from the letters C. I. F.; there was a specific London policy underwritten on this cargo (coal) alone; the usage in New York was universal to accept such certificates as performance; the policy as underwritten is valid under the laws of England where it was made.

"It is the business of courts," said the judge, "reasonably so to shape their rules of evidence as to make them suitable to the habits of mankind (Humfrey vs. Dale, 7 E. & B. 266, 278). When a usage of this kind has become uniform in an actively commercial community, that should be warrant enough for supposing that it answers the need of those who are dealing upon the faith of it. I cannot see why judges should not hold men to understandings which are the tacit presuppositions on which they deal. From Lord Holt's time on they have generally in one way or the other been forced in the end to yield to the more flexible practices of commercial usages. So far as I know, the results have been generally acceptable to everyone, once they were settled. . . . Usages are never of importance unless they modify rights which would otherwise result. The fact that the usage imposes a risk upon the buyer which he would not incur if a policy were delivered is not, I think, so vital to the substance of the contract that it may not be interpolated into the contract by implication. This raises the general question of how far the usage contradicts the language of the contract. 'Insurance' certainly does not literally mean a 'policy of insurance'. When the buyer has a policy of insurance awaiting his demand and covering the loss and that alone, why should the situation be thought to contradict a contract giving him only 'insurance'? Is it less insurance because, though he has received symbolic delivery of the policy and actual delivery of the document which controls its production, he has not the policy itself? I must own that I cannot see why."

The demurrer was overruled.

American underwriters are hailing the decision with delight.

"Oh, wise and upright judge!
You know the law, your exposition
Hath been most sound!"

Cotton Season Changed

It has been the conviction of marine underwriters for some time that by beginning the cotton season on September 1 too much early cotton, starting from the gins in August and getting away from port toward the end of the month, has been falling within the old season limits. An arrangement has accordingly been made whereby policies for the 1924-1925 season will run for eleven months only, so that the cotton season of 1925-1926 will begin August 1, 1925.

Would Abolish General Average

European students of marine insurance are busily engaged in a controversy as to the advisability of doing away with the venerable practice of general average. At the recent sessions of the Baltic and White Sea Conference the subject came actively to the fore, and since then it has been seriously discussed in, of all places, England. It will be remembered that the movement originated in the United States, although it never made much headway here. One English writer took the premise that railway companies do not expect passengers to contribute to the expenses of extra coal and labor involved in completing a journey after a mishap. In reply, another writer brands the premise as false. Says he: "This may be so, but would a passenger whose goods were sacrificed on a train journey, in order to save the property of all others concerned in the journey, be content to bear his own loss, or would he demand compensation from the railway company? What has been overlooked in the argument for abolition of general average in this case is that, by their contract of carriage, the railway company assumes the role of underwriters, although they would never admit it."

In point of fact, the system of general average, as practiced today, is admittedly cumbersome and costly. But it is unquestionably thor-

ough, determining liability with exact justice. In one form or another it has existed ever since men undertook to reimburse others against the hazards of the sea. Indeed, the entire system of marine insurance was originally based upon the very crude pioneer idea of mutual participation in the cost incurred in endeavoring to secure mutual protection. Times and methods have changed, it is true, but the basic idea remains unaltered.

Amended Warehouse Clause

The Institute of London Underwriters has adopted an amended warehouse to warehouse clause for insertion in their cargo clauses. It is effective as of July 1, and reads as follows:

"The risks covered by this policy attach from the time the goods leave the shipper's or manufacturer's warehouse at the port of shipment, unless otherwise stated, and continue during the ordinary course of transit, including customary transshipment, if any, until the goods are safely deposited in the consignee's or other warehouse at the destination named in the policy or until the expiry of fifteen days from midnight of the day on which the discharge of the goods hereby insured from the vessel is completed which ever may first occur. When the destination to which the goods are insured is without the limits of the port of discharge the risks covered by this policy continue until the goods are safely deposited in the consignee or other warehouse at the destination named in the policy or until the expiry of thirty days from midnight of the day on which the discharge of the goods hereby insured from the vessel is completed, whichever may first occur. Transshipment, if any, otherwise than as above, and or delay arising from the circumstances beyond the control of the assured, held covered at a premium to be arranged."

To Show Rates in Policies

Rates of premium very infrequently appear in policies in this country. Occasionally it is done with certain forms of special contracts, but not often. It was of more frequent occurrence prior to 1919, when difficulties arose over the tendency of certain brokers and shippers to over-charge in juggling the rates. Competitive disadvantages are felt to result from making the rate so public. It is, therefore, of interest to learn that in Great Britain a definite position is being taken by underwriters on this point. Over there, shippers and merchants have for some time been requesting that the rate be stated "as arranged", because they do not wish others through whose hands the documents pass to learn the terms upon which they have secured their insurance. But the underwriters insist that arrangements of this nature lead to grave abuse, and that it is in the interest of all concerned that policies bear the actual rate per cent received by them. However, in view of the fact that the insured are prejudiced in many instances, it is recommended by English underwriters that the open policy and certificate system be used, as the certificate, taking the place of the policy, does not contain any reference to the premium rate.

Wharfowners' Obligation

In event of a vessel having finished discharging and, for its own convenience, remaining at the pier for the purpose of being fumigated, recovery is possible for damage caused by fire which started on the wharf through the negligence of the wharfowner, according to a recent decision of the Circuit Court of Appeals for the Fourth Circuit, in the case of the Santa Barbara (1924 A. M. C. p. 800).

In this case the wharfowner contended that the vessel had completed her business of discharging and remained at the pier gratuitously, and that therefore there was no obligation on his part to keep the pier in safe condition. The court held, however, that while there was no express contract as to the use of the pier, the vessel remained there with the knowledge and consent of the owner. There was an implied obligation, according to the court, for the vessel to pay wharfage, and a corresponding duty rested on the wharfowner to use due care.

Passing of the Union Hispano

Impressive demonstration of the difficulty of conducting marine insurance in these dull days has been just given in the announcement of the retirement of the Union Hispano Americana Fire & Marine and its taking over by the Automobile Insurance Company of Hartford, which is one of the Aetna Life and Affiliated companies' group. This was done by a contract signed June 27. By this arrangement the Union Hispano turns over to the Automobile all new marine business by it from April 1, 1924, to June 19, 1924, and the latter assumes the former's liability or claims for loss, return premiums and cancellations on the marine insurance policies issued on or before March 31, 1924.

The New York Insurance Department has reported upon its recent examination of the Union Hispano, which was as of March 31, 1924. It shows an impairment of the company's capital amounting to $61,206 as of that date.

The Union Hispano was organized in 1922 with a capital of $400,000 and a surplus of $250,000 for the purpose of taking over the entire business and liabilities of the United States branch of the present company of the same name located at Havana, Cuba. During 1922 an additional $200,000 was paid into the surplus. The directors reorganized the company on March 31, 1924, cancelling its fire reinsurance con-

tracts, which represented about 75 per cent of its fire premium income, and 80 per cent of the remaining fire business was also reinsured and marine insurance on hulls discontinued. The New York Insurance Department's examination showed the company's financial condition on March 31 last to be as follows: Total admitted assets, $1,289,659; total liabilities, except capital, $950,865, which included a loss reserve of $354,608 for fire and $423,352 for marine. The unearned premium reserve was calculated at $152,395.

Freights and Charters

August 14, 1924.

THERE has been no improvement in the freight situation since our last report under date of July 17, and in fact parcel rates on grain from the North Pacific and from this port to the United Kingdom and Continent have shown a decline and the liners are taking lots at from 27 6 to 30 -, with very little in the way of volume moving even at these rates.

In full cargo fixtures, the British steamer Ashworth is fixed for wheat from the North Pacific to the United Kingdom or Continent at 32 6, Sept.-Oct. loading, by Suzuki & Co.; British stmr. Sierra Morena for the same business, and the same loading, at 32 6 by Kerr, Gifford & Co.; British stmr. Norburn for the same business, July-Aug. loading, at 30 -; British stmr. Bencleuch from Portland for the same business at 32 6, Sept. loading; Norwegian stmr. Hardanger at 32 - for the same business, Aug.-Sept. loading; British stmr. Issiofoglu from Portland for the same business, Sept. loading, rate not stated; British stmr. Baron Ogilvy, same business, Sept. loading, 30 -, by Bunge Western Grain Corp.; Swedish m. s. Laponia, Portland, same business, Sept.-Oct. loading, 30 -, by Gerr, Gifford & Co.

In lumber from the North Pacific to Australia, parcels have taken as low rate as $10 per thousand feet, and for full cargo fixtures we have to report Japanese stmr. Koyo Maru, $12 per thousand feet, to one port Newcastle-Port Pirie range, Sept. loading, by Balfour, Guthrie & Co.; Yogen Maru to three ports, same range, at $12.50, Sept. loading, by J. J. Moore & Co., and by the same charterers a Japanese steamer for two ports, same range, $12, Oct. loading. The Bankoko Maru is reported fixed by the Pacific Export Lumber Co. for two ports, Sept. loading, the rate not stated. Yamashita Co. has taken an August steamer for two ports at $11.75, and J. J. Moore & Co. a Sept.-Oct. steamer for two ports, terms private.

Space rates on lumber for Japan are reported as low as $6, and one cargo fixture, the Ryugin, at $8.50 for Sept. loading. W. L. Comyn & Co. has taken another Japanese steamer, the Belgium Maru, for the West Coast of South America for three ports discharge, Sept.-Oct. loading, at $10 per thousand feet.

For the Atlantic seaboard, American stmr. J. R. Gordon has been taken by A. C. Dutton Lumber Co. for lumber from the North Pacific to North of Hatteras, terms private; American stmr. Albert Jeffress for the same business by Krauss Bros. Lumber Co., terms private, and the Norwegian stmr. Golden Gate for the same business, from British Columbia, at $12, Sept. loading, by South Alberta Lumber & Supply Co.

The Danish stmr. Leise Maersk, Panaman stmr. Pawnee and British stmr. Ashworth are all bringing corn from Buenos Aires to this port at a reported rate of $6 per ton.

For the account of the Navy Department, three steamers are reported fixed to lift 14,000 tons of coal from Hampton Roads for discharge at Honolulu at a rate of $3.43 per ton, Aug. loading.

In tankers the following fixtures are reported: Mericos H. Whittier, Pacific Coast to Wellington, New Zealand, four round trips, 85 cents per barrel, by Union Steamship Co.; two Agwi tankers, California to North of Hatteras, 61 cents, Aug.; Lio, San Pedro to United Kingdom, $1.30, gasoline, Aug.; Clement Smith, California port to North of Hatteras, 67 cents, Sept.

Dutch stmr. Aagtekerk has been taken by Meyer, Wilson & Co. for Aug. loading for general cargo from the Continent and United Kingdom to this coast at 20 - per ton.

PAGE BROTHERS, Lumbermen

SHIPBUILDING AND SHIP REPAIRING

Bethlehem Obtains Large Conversion Job

BETHLEHEM Shipbuilding Corporation, Ltd., Union Plant, San Francisco, has signed a contract with the General Petroleum Corporation for the conversion of the tanker Lio to diesel propulsion. The tanker was recently purchased from the Shipping Board under the conversion plan, and the contract for the installation of diesel engines will represent an expenditure of $750,000.

The contract calls for the removal of the present turbine engines and auxiliary machinery, with the exception of the cargo pumps, and the installation of diesel machinery. The main engine is to be built at San Francisco and will be of the type known as the Bethlehem diesel, described in Pacific Marine Review for March and April, 1924. Auxiliaries will be driven by three 100 horsepower Bethlehem-Trout engines. The Bethlehem-Trout heavy oil engine is described on page 474 of this issue.

The main engine will have six cylinders, 2 cycle, with cylinders 27 inches in diameter by 5 foot stroke, developing 3000 horsepower at 85 revolutions per minute. The Bethlehem-Trout heavy oil engines will consist of three 4 cylinder 100 horsepower engines, which will be used for generating electricity for driving the auxiliaries.

A six cylinder engine of the type to be installed in the Lio has been operating at the Bethlehem, Pennsylvania, plant for the past two years under the most trying conditions. This same type engine is also installed on the motorship Cubore. Experts of the General Petroleum Company have made an exhaustive study of the diesel engine question both in the United States and Europe, and have decided in favor of this power plant for the conversion of their tanker.

The Lio is a vessel of 11,000 deadweight tons. She was built in 1921 by the Baltimore Shipbuilding & Drydock Company, and is 430 feet long, 59.2 feet breadth, and 33.4 feet depth.

The engine will be the largest yet built in the United States. The total length of the engine is 46 feet and the weight is approximately 900,000 pounds. We are glad to see that the engineers in installing a diesel engine in this first large conversion job under the new Shipping Board program are approaching the proposition from a strictly marine angle, as is evidenced by the fact that they are not ashamed or backward in stating the size and weight of the main engines. Size and weight are in this case, we believe, good evidence of stability and permanency in this power plant.

Trans- the Shippin, Shipbuilding C

in operated by the Pacific Mail Steamship Company for last after a complete reconditioning job by Bethlehem

One of the two Canadian Fisheries patrol boats recently completed by the Prince Rupert Drydock & Shipbuilding Company.

MAY CONVERT TANKER

The Standard Oil Company(California) has for some time been considering the conversion of its tanker K. R. Kingsbury to diesel-electric drive, and for the purpose of ascertaining the cost of such conversion and the possible saving in operation to be effected thereby, bids have been asked from American shipyards. The bids submitted were as follows.

Bethlehem Shipbuilding Corporation, $238,297 and 99 days.

Los Angeles Shipbuilding & Drydock Corporation, $199,999 and 99 days.

Moore Dry Dock Company, $257,000 and 110 days.

Todd Drydock & Construction Corporation, Tacoma, $448,000 and 120 days.

Newport News Shipbuilding & Drydock Corporation, $256,000 and 130 days.

Sun Shipbuilding Company, $358,000 and 120 days.

It has not been decided as yet whether the conversion will be made.

Specifications issued by the Standard Oil Company on which the bids were based call for the removal of of the boilers and main engines now in the tanker and the installation of three 1200 horsepower diesel engine generator sets electrically connected to a motor developing 2800 horsepower.

The K. R. Kingsbury is one of the newest and largest of the Standard Oil fleet, having been built at the Alameda plant of the Bethlehem Shipbuilding Corporation in 1921. The vessel is 4425 net tons and is 440 feet long with a beam of 58.2 feet and a depth of 33.1 feet.

Work in Prospect

A new coastwise freight and passenger vessel for the Pacific Coast is being proposed for the Canadian National Railways. Preliminary plans have been drawn up. The general dimensions are:

Length over-all	340′
Length between perpendiculars	330′
Breadth	47′
Depth to main freeboard deck	18′6″

It is rumored that the contract for building this vessel will be awarded one of the shipyards on the Canadian Pacific Coast in the near future.

It is reported that the Canadian Pacific Steamships, Ltd., are contemplating the conversion of their two trans-Pacific steamships into oil burners; these are the Empress of Asia and the Empress of Russia.

IN PACIFIC COAST SHIPYARDS

SHIP REPAIRING
SHIP BUILDING
RECONDITIONING
ENGINE REPAIRS

It is rumored that the United Fruit Company will build in this country three types of motorships; one of 7000, one of 10,000, and one of 14,000 tons.

The Barber Steamship Lines may apply for a loan to the Shipping Board Construction Loan Fund for the construction of new motorships or the conversion of steamships to diesel propulsion.

Recent Contracts

J. C. Johnson's Shipyard, Port Blakely, Wn., has an order for three scows for the Washington Tug & Barge Co., Seattle, for delivery about November 1. The scows are to be 105 feet long, 36 feet beam, and 10 feet depth.

Pacific Coast Engineering Co., Oakland, Calif., started construction the first of August of an oil tow barge of 3000 barrels capacity for the Associated Oil Co. The barge will be 106 feet long, 32.6 feet breadth, and 8 feet depth. The contract was awarded on a bid of $29,960. Other bids submitted were: Todd Dry Docks, Inc., Seattle, $49,880; Moore Dry Dock Co., $44,843; Bethlehem Shipbuilding Corp., $56,400; Los Angeles Shipbuilding & Drydock Corp., $44,800; General Engineering Corp., $57,633.

American Bridge Co., Pittsburgh, Pa., has contracts for two dump scows for the Pittsburgh office of the Army Engineers; one car transfer barge with two tracks for the Missouri Illinois Railroad Co.; and two barges for the Missouri Portland Cement Co., St. Louis.

Newport News Shipbuilding & Drydock Co. has received an order from the Atlantic, Gulf & Pacific Co., 15 Park Row, New York, for a diesel-electric hydraulic pipe line dredge. The vessel will be 162 feet long, 38 feet beam, and 12½ feet draft. Contracts for three engines have been awarded to McIntosh & Seymour Corp., Auburn, New York; one of 1150 horsepower for operating the main pump and two 500 horsepower engines for propulsion purposes. Westinghouse Electric & Mfg. Co. will supply the electrical equipment.

Charles Ward Engineering Works, Charleston, W. Va., has contract from the Army Engineers, Huntington, W. Va., for two maneuver boats, 60 feet by 20 feet by 3 feet 4 inches, to cost $33,050.

Keel-layings

Carfloat for the Erie Railroad by the Bethlehem Shipbuilding Corp., Harlan Plant, Wilmington, Delaware, July 12.

Combination steamer, Clyde Steamship Co., by Newport News Shipbuilding & Drydock Co., July 12; yacht for Alfred I du Pont, Aug. 6.

Steel hull tugboat, Grace Lines, Inc., Spedden Shipbuilding Co., Baltimore, Md., July 15.

Deliveries

Four barges, U. S. Engineers, Florence, Ala., by American Bridge Co., Pittsburgh.

Yoreda, yacht, for Aaron De Roy, by the De Foe Boat & Motor Works, Aug. 10.

Sailor, towboat, Jones & Laughlin Steel Corp., Marietta Manufacturing Co., July 22.

Dobbin, destroyer tender, for U. S. Navy, Navy Yard, Philadelphia, July 23.

Two carfloats to Harlem Transfer Co., New York, by New York Shipbuilding Corp., during July and August; two carfloats, New York Central Railroad, August.

Dan C. Kingman, hopper dredge, to U. S. Engineers, by Sun Shipbuilding Co., Aug. 14.

Repair Awards

Commercial Iron Works, Portland, Oregon, was awarded contract for damage repairs to the steamer Sumanco the first of August on a bid of $59,000 and 28 days.

* * *

Tietjen and Lang plant of the Todd Shipyards Corporation, received contract from the Eastern Steamship Company for damage repairs to the steamer Boston on a bid of $129,000 and 38 days. Other bids submitted were: Fletcher & Company, $139,000 and 40 days; Staten Island Shipbuilding Company, $140,000, 48 days; Morse Dry Docks, $144,800, 42 days.

* * *

Mare Island Navy Yard will perform docking and repairs to stern frame of the Shipping Board steamer Pawlett on a bid of $11,233, submitted in June. Crowley Shipyards, Oakland, has just completed voyage repairs to this vessel on a bid of $20,201, the Navy Yard bid for this work having been $32,315.

* * *

General Engineering Works, San Francisco, was successful bidder on repairs to deck betterments and enlargement of chain lockers of the Shipping Board freighters West Carmona and West Sequana, $2192 for both vessels.

* * *

United Engineering Works, Oakland, was successful bidder for the job of repairing the Dollar liner President Monroe, securing the work by a bid of $2261.

* * *

Yard Notes

The Fore River Plant of the Bethlehem Shipbuilding Corporation has contract for the modernization of the battleships Rivadavia and Moreno of the Argentine Navy. The contract includes the installation of Curtis turbine engines, fitting of boilers for burning oil, and modernization of the fire control system. Work will begin about September 1.

* * *

With the falling off of ship repair and shipbuilding work, the Moore Dry Dock Company, Oakland, California, is turning its attention to the production of structural steel, and on the first of August had contracts on hand totaling more than $700,000 with others in sight. Many contracts held by the Moore Company are from the Atlantic seaboard.

This company has just closed a contract for the 10-foot diameter pipe for the Pitt River project of the Pacific Gas & Electric Company, San Francisco, 1100 tons. Their recent contracts on structural steel includes Jonathan Club, Los Angeles, 1800 tons; Jewish Synagogue, San Francisco, 2000 tons; Pacific Portland Cement Company, Redwood City, California; stations D and L for the Pacific Gas & Electric Company, Oakland.

The Moore Dry Dock Company was awarded contract July 30 for structural steel addition to the warehouse of the California-Hawaiian Sugar Refinery, San Francisco Bay, 1400 tons.

* * *

Ballard Marine Railway Company, Seattle, is reconstructing the wooden steam schooner San Jacinto, owned by the Border Line Transportation Company. Work includes changing from a single to a two-deck carrier, installation of freight elevator, widening of deck house, and general overhaul and improvements.

* * *

The steamer Colombia, owned by the Pacific Mail Steamship Company, which was wrecked off Costa Rica on June 19, is being repaired at Balboa. Report of work to be performed disclosed that 100 plates on the bottom of the Colombia were damaged, sixty-eight of which will have to be replaced. The work will cost in the neighborhood of $200,000.

* * *

The Fire Commission of Los Angeles Harbor, which has under inspection the plans for a fireboat to cost $400,000 authorized at a recent election, is considering the advisability and legality of a proposition to build two smaller fireboats to cost $200,000 each. It is claimed by some members that fire protection for the harbor would be better served by two small rather than one large boat. The boat or boats will probably be built by the Los Angeles Shipbuilding & Drydock Corporation.

* * *

The Baltimore, Newport News and Norfolk Company was recently organized at Baltimore for the operation of a freight and passenger service between Baltimore, Old Point Comfort, Newport News and Norfolk. Jackson Brandt, 605 American Building, Baltimore, is president of the new company, which has an authorized capital stock of $250,000 preferred and $500,000 common, and will operate under the name of the Lee Line.

The newly organized shipyard of the Crosby Marine Corporation, Seattle, received an order on August 8 for a new diesel tug for the Tacoma Tug & Barge Company. The tug will be equipped with a 125-horsepower Sumner semi-diesel engine, constructed by the H. W. Sumner Company of Seattle.

The Colby Steel & Engineering Company, Seattle, has orders for fourteen Barlow marine elevators; specifically, three for Powell River, B. C., eight for Vancouver, B. C., and three for Portland, Oregon.

The Portsmouth, New Hampshire, Navy Yard, will build the new mine-laying submarine for the Navy Department. Engines will be built at the Brooklyn Navy Yard. Congress has allowed $5,300,000 for the hull and machinery of this submarine and $850,000 for armor and armament.

A. W. de Young, shipbuilder of Alameda, California, is planning to incorporate his shipbuilding activities in order to expand the plant. The new company will be called the A. W. de Young Boat & Shipbuilding Company with an authorized stock of $150,000. The principal stockholders will be A. W. de Young and R. J. Connor. The new company will acquire an additional 100 feet frontage and 350 feet depth. A new pattern loft and shop are being constructed and a warehouse will soon be under way.

This company, although only a short time in this field, has secured a number of orders, among them contract for the construction of ten rum runner chasers for the government; a new pile driver for the Board of State Harbor Commissioners, San Francisco; a snag barge; and contract to make improvements at the Dollar Steamship Company's dock, San Francisco.

Progress of Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT Potrero Works

Purchasing Agent, O. W. Streett.

No name, hull 5322, cargo steamer, Hawaiian Meat Co., Honolulu, 390 LOA, 56.5 m.; 11 loaded draft, 12 mi speed; IE engine, 2 water tube boilers; keel June17/24; launch Sept15/24, est.

No name, hull 5323, ferry steamer, Key Route, San Francisco; Trans Co., 234 LOA, 44 beam; 12 loaded draft; 35 mi. speed; IE engs; 3 Scotch boilers; keel June19/24; launch Nov26/24, est.

No name, hull 5324, ferry steamer, sister to above; keel July7/24; launch Dec1/24, est.

No name, hull 5325, ferry steamer, sister to above.

A. W. de YOUNG Alameda, Calif

Purchasing Agent, Robt. J. O'Connor.

Barge No. 4, Pac. Portland Cement Co., San Francisco, 100 LBP; 32 beam, 6 ft. 9 in. loaded draft; keel Apr18/24; launch May31/24, est.; deliver June1/24, est.

Barge No. 5, Pac. Portland Cement Co., San Francisco, launch May31/24, est.; deliver June1/24, est.

No name, hull 1, cabin cruiser, Coast Guard Service, 75' LBP, 13-6 beam, twin screw; 2 440 HP Sterling high speed engines.

No name, hull 2; sister to above.
No name, hull 3; sister to above.
No name, hull 4; sister to above.
No name, hull 5; sister to above.
No name, hull 6; sister to above.
No name, hull 7; sister to above.
No name, hull 8; sister to above.
No name, hull 9; sister to above.
No name, hull 10; sister to above.

J. C. JOHNSON'S SHIPYARD Port Blakely, Wn.

Tug [illegible], Washington Tug & Barge Co., Seattle; 153x36x14; delivery Nov1/24, est.

THE MOORE DRY DOCK CO. Oakland, Calif.

Purchasing Agent: N. Levy.

No name, hull 167, oil barge, Associated Oil Co., S. F.; 140 LBP; 30 beam; 7-6 loaded draft; Pacific diesel engs; 220 BHP; keel May12/24; launch Aug28/24, est.; deliver Sept10/24, est.

NAVY YARD Puget Sound

Melissa, repair ship for government; 460 LBP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng, 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan2/20; launched Apr16/23; deliver May15/24, est.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons disp; keel Apr11/21; delivery Apr1/25, est.

TODD DRYDOCK & CONSTRUCTION CORPORATION
Tacoma, Wash.

Bienville, hull 43, passenger and freight stmr, Southern Pacific Co.; 445' LOA; 57' beam; 23' loaded draft; 16 knots speed; 7000 DWT; keel Feb26/24; launched July16'24; deliver Nov/24, est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty coal barges, Carnegie Steel Co.; 175x26x11; 16 delivered.

Nineteen barges, U. S. Engineers, Louisville, Ky.; 110x26x6-6; 17 delivered.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft.; deliver 1924, est.

Sixteen barges, U. S. Engineers, Louisville; 110x26x6-6; deliver Oct1, 24, est.

Eight barges, U. S. Engineers, Florence, Ala.; 120x30x7; 4 delivered.

Fifteen barges, Amer. Steel & Wire Co., Pittsburgh; 100x26x9-3; deliver 1924.

Twelve barges, Penn. Coal, Iron & R. R. Co.; 140x25x8-6; deliver summer 1924.

Two dump scows, U. S. Engineers, Pittsburgh; 100x26x5-10; deliver Aug27'24, est.

One car transfer barge, Missouri Illinois R. R. Co.; 225x38x10; 2 tracks; deliver Dec1'24, est.

Two barges, Missouri Portland Cement Co., St. Louis; 175x36x8; deliver Sept1'24, est.

THE AMERICAN SHIP BUILDING COMPANY
Lorain, Ohio

W. H. Gerhauser, vice-president and director of purchases.

Greater Detroit, hull 785, paddle stmr, Detroit & Cleveland Nav. Co.; 355' LBP; 98' beam; 16 loaded draft; 20 mi. loaded speed; 3 cyl. comp engs, 10,000 IHP; 6 SE and 3 DE Scotch boilers, 14x20; keel Feb1'23, launched Sept14/23; deliver spring 1924.

Greater Buffalo, hull 786; sister to above; keel May2/23; launched Oct27'23.

Henry Ford II, hull 788, bulk freighter, Ford Motor Co.; 590' LBP; 62' beam; 20 loaded draft; 13 loaded speed; 12,000 DWT; 3300 IHP; Doxford diesel engs; keel Dec10/23; launched Mar 1/24.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT
Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N.; Massachusetts, hull 1400, battleship U.S.N.; to be scrapped.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT
Wilmington, Del.

Hull 3490, carfloat, C. R. R. of N. J.; 325' LB P.; 38-6 beam; 1330 gross tons; keel M 13/24.

Hull 3491; same as above; keel May14'24.

Hull 3492, carfloat, Erie Railroad; 325' LBP; 38-6 beam; 1430 gross tons; keel July12'24.

Hull 3493, carfloat, sister to above; keel July 23'24.

Hull 3494, carfloat, Bush Terminal; 275x37-6 x10-0; keel June9'24.

Hull 3495; sister to above.

BETHLEHEM SHIPBUILDING CORPORATION, SPARROWS POINT PLANT
Sparrows Point, Md.

Hull 4230, carfloat, B. & O. R. R.; [illegible] keel June'24.

Hull 4[illegible]; sister to above.

Hulls 4232-4233, steel [illegible] Corporation.

CLINTON SHIPBUILDING & REPAIR COMPANY
Philadelphia, Pa.

No. name, hull 45, oil barge, City of [illegible]; 88' LBP; 30' beam; 8' bottled draft; keel [illegible]/24, est; launch July24, est; deliver Aug 24, est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2764, 240-ft cruiser, H. W. Hess.

Hull 2767, 40-ft cruiser, F. S. Sloane; 300 HP Speedway engs.

Hull 2770, fishing boat, J. F. Bruce; 300 HP Speedway engs.

Hull 2773, Experimenter, Hudson Motor; 46x10-6; 150 HP Speedway engs.

Hull 2774, cruiser, J. B. [illegible]; 300 HP Speedway engs.

Hull 2775, yacht tender, A. B. Dick; 23x5-8; 25 HP Speedway eng.

Hull 2777, cruiser, M. M. Belding; 50x12; 2 M-6 Speedway engs.

Hulls 2778-9, plas boats for stock; 34x9-6.

Hull 2780, steel cruiser, W. O. Briggs, 115x 21; 2 189 HP Winton diesel engs.

Hull 2787, cruiser, [illegible], Harry Payne Whitney; 29x7; Gold Cup Packard eng.

COLLINGWOOD SHIPBUILDING COMPANY
Collingwood, Ontario

Royalton, hull 73, bulk freighter, Matthews Steamship Co.; 536-6 LBP; 58 beam; 31 molded depth; 13,000 DWT; 13 mi. loaded speed; 2800 h.p. TE engs; 3 Scotch boilers, 14-10-9; keel Dec31/23; launch Aug24/24, est; deliver Sept 15/24, est.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.
Philadelphia, Pa.

Purchasing Agent: E. C. Grehr.

Mahan, hull [illegible], scout cruiser, U.S.N.; keel [illegible]/24; launched Oct9'23; 94' x [illegible]; [illegible] 24.

Wilson, hull [illegible], scout cruiser, U.S.N.; keel [illegible]; launched May17'24; 71% per cent complete.

[illegible], hull [illegible], twin screw passenger yacht; [illegible] Matson Navigation Co.; 375' LBP; [illegible] loaded draft; 18 knots speed; [illegible] turbo electric engs; 20,000 SHP.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

Purchasing Agent: G. O. Williams.

No. name, hull 42, yacht, builder's account; 55' LBP; 12' beam; 4' draft; 14 speed; Standard gas engines; keel laid Jne 28'22; launched Aug 6'24; delivered Aug1'24.

Yacht, hull 76, yacht, Aaron De Ross; 62 LBP; 12-6 beam; 4 loaded draft; 1x0 IHP gas engs; keel May8'24, delivered Aug10'24.

C. G. [illegible], hull [illegible], [illegible] U. S. Coast Guard; 75 long; 15 [illegible].

DRAVO CONTRACTING COMPANY
Pittsburgh, Pa.

Hulls 326-327, inc, 6 steel derrick boats; 115' over-all; 36' each; for U.S. Engineers, Louisville, Ky.

Hull [illegible], steel dredge; Ohio River Sand Co., [illegible]; [illegible]x42x7-6; 43 tons.

Hull 334, sand digger, Keystone Sand & Supply Co.; 135'x42'x7'-6"; 420 tons.
Hulls 335 and 336, 2 derrick boat hulls; 40x[illegible] ft; builder's account; 100 gross tons.
Hulls 337-40, 4 steel deck barges, builder's account; 100x26'x6'-6"; 135 gross tons ea.
Hulls 341-4, 4 sand and gravel barges, builder's account; 135'x27'x8'; 320 gross tons ea.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent: R. S. Lage.
No name, hull 81, freight stmr. Southern Pacific Co.; 433 LBP; 56 beam; 26 loaded draft; 14½ loaded speed; 7950 DWT; turbine engs; 900 IHP; 4 B&W boilers.

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent: Chas. Short.
Benson Ford, hull 245, bulk freighter, Ford Motor Co.; 586 LBP; 62 beam; 20 loaded draft; 14 mi speed; 13,500 DWT; 3000 IHP Diesel engs; keel Nov26 23; launched Apr26 24; delivered Aug1 24.
Edward L. Berwind, hull 247, freighter, Franklin S. S. Co., Cleveland; 612 LOA; 586 LBP; 62 beam; 32 depth; 20 loaded draft; 13,500 DW T.; 12 mi speed; keel Feb28 24; launched July 12 24; deliver Oct1 24, est.
No name, hull 248, bulk freighter, Columbia S. S. Co., Cleveland; 618 LOA; 592 LBP; 62 beam; 32 depth; 20 draft; 13,500 DWT; 12½ mi speed; keel June1 24; deliver Mar1 25, est.

HOWARD SHIP YARDS & DOCK COMPANY
Jeffersonville, Ind.

Purchasing Agent: Jas. E. Howard.
Steel tow boat; 140 long; 32 beam; 6½ depth mld.
Two steel river boats, U. S. government.
No name, Algiers Public Service, Inc., New Orleans; 150 feet 6 inches long.
No name, ferryboat, similar to above.

MARIETTA MANUFACTURING CO.
Point Pleasant, W. Va.

Purchasing agent: S. C. Wadsworth.
Sailor, hull 137, towboat, Jones & Laughlin Steel Corp.; 165 LBP; 36 beam; 7-6 depth; 165 gross tonnage; 16x32x8 ft Tandem comp engs, western river return tubular boilers; keel Oct 1 23; launched Mar28 24, delivered July22 24.
No name, hull 138, sternwheel towboat; 125x30x5-2; tandem comp engs; Western rivers return tubular boilers; keel May1 24.
No name, hull 139; sister to above; keel May 15 24; launch July1/24, est; deliver July15, 24, est.

MIDLAND BARGE COMPANY
Midland, Pa.

Purchasing Agent: H. S. Neal.
Steel boat and hoppers for Second Pool Coal Co., Pittsburgh.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Pere Marquette 21, hull 209, car ferry, Pere Marquette Ry. Co.; 348 LBP; 56 beam; 16 loaded draft; 14 mi loaded speed; 2 sets TE engs; 2750 total IHP; 4 Scotch boilers, 14x[illegible] 11; 18 lbs. pres; keel Oct1, 23; launched Mar18 /24; deliver May1, 24, est.
Pere Marquette 22, hull 210, sister to above; keel Dec20, 23; launch summer, 24.
Hull 211, steel barge, War Dept. U.S.gov.; 175 ft long; 40 ft molded beam; 11 ft 6 in molded depth; keel Mar18 24.
Hull 212, steel tug, Great Lakes Dredge & Dock Co., Chicago; 75 ft long, 21 ft molded beam; 11 ft molded depth; 300 IHP Fairbanks Morse CO engs; keel Jan12, 24; launch Apr7 24, est.
Hull 213, sister to above; keel Jan19 24; launch Apr7 24, est.

MIDLAND SHIPBUILDING COMPANY, LTD
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.
Glenlifer, hull 12, bulk freighter, Great Lakes Transp. Co.; 560 LOA; 60 beam; 20.6 draft; 3 Scotch boilers; keel May8 24; launch fall 1924

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Leo E. Wege.
No name, hull 65, dredge, W. T. Hardison & Co.; 110 LBP; 30 beam; 6 loaded draft; keel July15/24, est; delivery Aug15/24, est.
Hulls 66-71, inc, pontoons, U.S. Engineers, Cincinnati; 40 LOA; 12 beam; 3 loaded draft; keels June10, 24, est; deliver Aug15/24, est.
Hull 76, deck barge, U.S. govt., Louisville; 120x36x7-6ft; keel Apr17/24; launched June 27 24; deliver July27 24, est.
Hull 77, sister to above; keel May23/24; launched July8-24; deliver July27/24, est.
Hull 80, deck barge, builder's account; 100 LBP; 24 beam; 5 loaded draft; keel July1/24, est.
No name, hull 81, dredge boat hull, T. L. Herbert & Sons; 110 LBP; 30 beam; 6 draft; keel July20/24, est; launch and deliver Sept1/24, est.

NAVY YARD
Boston, Mass

Whitney, destroyer tender No. 4, U.S. Navy; 460 LBP; 61 beam; 21 loaded draft; 16 knots loaded speed; 10,600 tons disp; 7000 SHP geared Parsons turbines; 2 WT express type boilers; keel Apr23, 21; launched Oct12/23; deliver Sept 1, 24, est.

NAVY YARD
Philadelphia, Pa.

Dobbin, hull 7, destroyer tender, U.S.N.; 460 LBP; 60 10 beam; 21 loaded draft; 16 loaded speed; 10,600 tons disp; Parsons geared turbine single screw engs, 7000 SHP; 2 WT boilers; keel Dec23 19; launch May5/21; delivered July 23 24.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.
George Washington, hull 276, freight and passenger stmr, Old Dominion Steamship Co.; 375-6 LBP; 53 beam; 29-9 depth; speed 16 knots; 2100 DWT; Newport News-Curtis turbines, 4750

SHIPBUILDING DEPARTMENT
(Continued on Page 77)

(Continued from Page 158)

and Denmark, and possibly Colombia, enjoy the same privileges. Vessels belonging only in part to such nationals may be discriminated against without violation of any treaty.

Vessels of Costa Rica, Great Britain, Honduras, Liberia, the Netherlands, and Norway Tonga, and possibly Colombia, enjoy the same privileges. However, it would seem that it is, perhaps, within the power of the United States to lay down conditions as to what shall be considered a vessel of any one of these states, without violation of a treaty stipulation.

States possessing no commercial treaty with the United States, or parties to a treaty which contains no pledge of national treatment of their vessels with respect to tonnage dues in ports of the United States and no applicable most-favored nation clause, enjoy national treatment only by virtue of United States law.

Possible Discriminatory Tonnage Dues

It would seem to be possible, then, for the Congress of the United States to adopt legislation providing:

1. Discriminatory tonnage duties to be levied on all vessels, except those possessing treaty pledges of national treatment.

2. Such duties to be collected from vessels owned only in part by nationals of such states as possess treaty pledges covering only vessels owned wholly by nationals of those states.

3. Except where treaty provisions specify differently, the nationality of vessels claiming national treatment under existing treaties to be determined by whatever conditions Congress may see fit to lay down concerning construction, officers, nationality of crew, and ownership.

A final word should be said concerning the status of vessels of states possessing no pledge of the United States guaranteeing national treatment with respect to tonnage dues. Although not protected by treaty, they are, by United States law, given national treatment, provided that they present proof to the President of the United States that they levy no discriminating tonnage or customs duties against United States vessels or their cargoes.

Thus section 4228, Revised Statutes, provides as follows:

Sec. 4228. [illegible] proof to the satisfaction of the President by the government of any foreign [illegible] discriminatory duties of tonnage or imposts are imposed or levied in the ports of such foreign [illegible] wholly to citizens of the United States, or in vessels wholly manufactures, or both, [illegible] imported in the same [illegible] the United States or from any foreign port or place, [illegible] dent may issue his proclamation declaring that such discriminating duties of tonnage and impost within the United States are [illegible] respects the vessels of the United States, their [illegible] manufactures, or both, when [illegible] States from, and to, any foreign country, the suspension [illegible] notification being given to the President [illegible] long as the reciprocal exemption of vessels [illegible] citizens of the United States and their [illegible] continued and no longer.

Under these provisions President Harding issued proclamations on March 22, 1922, and January 25, 1923, restoring national treatment with respect to tonnage and impost to the vessels of Germany, Austria, and Hungary.

Repeal of this law would, of course, bring into effect any provisions for discriminatory duties contained in existing laws. It would seem that the only laws now in force which possess any unconditional discriminatory feature are paragraph 4225, Revised Statutes, which provides that "a duty of fifty cents per ton to be denominated 'light money' shall be levied and collected on all vessels, not of the United States, which may enter the ports of the United States," and that portion of section 4219, Revised Statutes, as amended by act of February 27, 1877, which provides that "any vessel any officer of which shall not be a citizen of the United States shall pay a tax of fifty cents per ton." The extra tax of 50 cents per ton on foreign vessels provided in the first paragraph of section 4219 is subject to suspension "if the President of the United States shall be satisfied that the discriminating or countervailing duties of such foreign nations, as far as they operate to the disadvantage of the United States, have been abolished." The repeal of section 4228, Revised Statutes, would not, it is evident, affect the provision for the suspension included in section 4219 itself.

Finally it would seem that the President has no authority by law to suspend the operation of Revised Statutes, section 4225, above cited, and that consequently the 50-cent "light money" should be collected from all vessels belonging to nationals of states not possessing treaty pledges to the contrary, namely, all those possessing no commercial treaty, and all those possessing commercial treaties without specific guaranty concerning "light money", or an applicable most-favored-nation clause, such as China, as above mentioned.

Customs Duties

As in the case of tonnage duties, the law of the United States extends national treatment with respect to customs duties on cargoes carried in vessels of states that have no treaty pledges on the subject, and also extends it to the whole cargo of vessels of those states which possess pledges only in respect to a defined portion of the cargo. Section 4228, Revised Statutes, already cited, applies to discriminating duties both of tonnage and impost, and to cargo imported directly from the foreign state in question, or from some third state. The law expressly provides that whenever a foreign state shall have complied with the conditions required by the statute, namely,

[illegible]

Definite treaty pledges are thus not required. Germany and Austria, for example, as we have seen, have by presidential proclamation been granted national treatment, despite the fact that treaty pledges of national treatment in respect to customs and tonnage contained in the treaties of peace with these states are unilateral, binding Germany and Austria but not the United States.

Repeal of this law would remove all protection against discriminatory customs duties levied on the cargoes of vessels of states not in treaty relations with the United States, as, for example, the vessels of Sweden, Greece, Brazil, etc. It would also make possible the collection of discriminatory duties on such portion of the cargoes carried on vessels of states

possessing only limited pledges as did not come within the terms of the pledge. For example, any goods carried on a British vessel from other than a European port of Great Britain could be made to pay a higher rate of duty than if carried on an American vessel, and any goods carried on a British vessel from any port whatever not being the produce or manufacture of Great Britain's European possessions could be subjected to a similar higher duty.

For example, section IV, paragraph J, subsection 1 of the tariff act of 1913 provides that—

A discriminating duty of ten per centum ad valorem, in addition to the duties imposed by law, shall be levied, collected, and paid on all goods, wares, or merchandise which shall be imported in vessels not of the United States, or which being the production or manufacture of any foreign country not contiguous to the United States shall come into the United States from such contiguous country; but this discriminating duty shall not apply to goods, wares, or merchandise which shall be imported in vessels not of the United States entitled at the time of such importation by treaty or convention or act of Congress to be entered in the ports of the United States on payment of the same duties as shall then be payable on goods, wares, and merchandise imported in vessels of the United States, nor to such foreign products or manufactures as shall be imported from such contiguous countries in the usual course of strictly neutral trade.

Repeal of Revised Statutes, section 4228, would, as we have just seen, remove all protection dependent solely on act of Congress, and so would permit the collection of the additional 10 per centum ad valorem duty on cargoes of vessels of states not in treaty relations, and that portion of the cargoes of British and French vessels not covered by the pledges of the treaties with the two states, respectively.

Power of Congress

The most that Congress can do is to direct the President to give the required notice and to provide that after a given period of time the treaties shall cease to be binding on any department of the government. The latter provision would be sufficient, however, to remove any barrier to the collection of discriminatory customs or tonnage duties. Nor could Congress be justly accused of international bad faith. In directing the President to give the required notice it would have exhausted its resources for securing a termination of the treaties as binding contracts.

Summary of Conclusions as to Power to Abrogate

To summarize the conclusions of this section of the survey it may be said that—

1. The President and two-thirds of the Senate may give the notice required for the abrogation of treaties.

2. The President, on authorization by Congress, may give such notice.

3. When Congress, in the exercise of a constitutional function, such as the control of foreign commerce, or the right to levy taxes, finds it necessary to secure the abrogation of existing treaties, its decision is final, and the duty of the President to give the notice is ministerial, it not being the intention of the Constitution to vest the right to determine commercial and fiscal policy in the President, but in Congress.

4. The direction of the President by Congress to give such notice is a legitimate exercise of the power to determine commercial and fiscal policy, and so is not an unconstitutional exercise of the power over foreign affairs.

5. The President is not free to ignore such a law when passed because he considers it unconstitutional. He is bound by the Constitution and his oath to enforce the law; that is, all law passed in a constitutional manner. It is for the Supreme Court alone to declare a law unconstitutional.

6. In case the President fails to act, Congress cannot terminate the treaties by law. It may, however, terminate them as binding municipal law, and the responsibility for violation of treaties would rest on the President, not Congress.

7. These observations apply with equal force to commercial treaties which make no specific provision for termination or notice, such a right being implied from their subject matter. The only requirement would seem to be that the period of notice be reasonable.

Finally it should be observed that section 4228 of the Revised Statutes does not stand on a footing different from that of any other statute. It grants certain privileges on certain conditions, to be sure. But a permanent contract cannot be made by statute. The only constitutional method for the creation of such a contract is the treaty-making process. Repeal of this law would, of course, leave states affected by it free to enact discriminatory legislation in their turn, but there would not be the slightest violation of the good faith of the United States. Privileges granted by statute may be recalled by statute.

In general, then, it is possible for Congress—

1. To repeal all provisions of statutes extending to foreign states protection against discriminatory customs duties.

2. To levy higher customs duties on goods carried on foreign vessels than when carried on vessels of the United States, subject to the proviso that no treaty or convention be violated.

3. To levy higher customs on goods carried on vessels of states other than that of which the goods are the produce or manufacture than when carried in vessels of the United States, subject to the proviso that no treaty or convention be violated.

4. To provide for a discount of a fixed percentage to be deducted from the rate established by law in case the goods are carried in vessels of the United States or of states possessing treaty pledges to national treatment in respect to customs duties on such goods.

5. To levy duties on goods now on the free list, and provide for their suspension in case the goods are carried in vessels of the United States or of states possessing treaty pledges to national treatment in respect to customs duties on such goods.

In practice these enactments should work out as follows:

Goods carried, say, on a Swedish vessel would pay an additional 10 per cent ad valorem duty. The same goods, if carried on a vessel of the United States, or, say, a Norwegian or Spanish vessel, would pay the rate fixed by law less 5 per cent. Goods carried from the Argentine in a British vessel would pay at the higher rate, but if imported in vessels of the United States at the lower one. If now on the free list, they would come in free of duty if brought in a vessel of the United States, but must pay a duty if brought in a British vessel.

The effects of this partial discrimination on the carrying trade of the United States would, of course, have to be carefully studied. In any event Congress can go no further without overriding existant treaties and conventions.

PERSONAL PARAGRAPHS AND ITEMS OF INTEREST

AS is shown by the reproduction of Lloyd's circular herewith, Thermit welds for certain purposes of temporary repairs to ships have received approval of Lloyd's Register.

This approval, of course, means that such repairs will be considered as permanent if no failure develops on examination over a period of several official inspections. The stricture in regard to approval for repairs to parts which may be under torsional strain does not carry with it any condemnation of all Thermit welds for such purposes, but means simply that so far as Lloyd's official approval is concerned, Thermit welds must wait in the field of torsional members until sufficient tests have been made by Lloyd's in this connection.

Thermit welds have been used with great success for temporary repairs in a great variety of structural failures aboardship, and this official recognition of their value has been well earned.

Circular No. 1429

Lloyd's Register of Shipping.

71, Fenchurch Street,
London, E.C.3. 4th July, 1929

THERMIT WELDING FOR SHIP REPAIRS

Dear Sir (or Sirs),

I am directed to state, for your information, and guidance, that the General Committee, who have had under consideration at a Special Meeting the subject of Thermit Welding for Ship Repairs, have decided to accept this system of welding for temporary repairs to such parts of the hull structure as do not have to sustain torsional stresses, provided the work be carried out by men thoroughly experienced in the application of the process and be done to the satisfaction of the Society's Surveyors.

The Committee will, however, require that such temporary repairs should be carefully examined periodically by the Society's Surveyors, and that in cases where the repairs are left in the water time they should be examined at each docking.

I am, Dear Sir (or Sirs),

Yours faithfully,

ANDREW SCOTT,
Secretary.

CLAIM AGENTS

The Puget Sound Marine Claim Agents' Association was recently organized in Seattle. The object of the body is to maintain a permanent organization for the purpose of co-operation in the matter of adjusting cargo damage claims. Claim agents representing nine companies in the intercoastal trade attended the initial meeting. Upon formation of the association, a committee was named to consider the advisability of extending the scope of the organization to include the claim agents of the trans-Pacific, European, coastal and other offshore lines. Joseph B. Mehan, claim agent for the Williams Line, was chairman of the first meeting. W. B. Taschek of the Luckenbach Line was secretary. Other well-known Northwestern steamship men attending the session were: V. S. Benson, General Steamship Corporation; C. W. Tibbitts, Norton, Lilly & Company; L. Rheinstrom, United American Line; M. B. Bursett, Munson-McCormick Line; M. V. Biggs, Transmarine Line, and C. Robinson, Swayne & Hoyt. Weekly meetings are being held until the organization is perfected.

ORIENT MARKETS

Oriental commerce centers are to be visited by a party of Seattle business heads, according to plans now fomulating. Special committees, headed by Captain J. S. Gibson, president of the International Stevedoring Company, are arranging the details for the tour. A gathering of foreign trade experts, Northwest manufacturers, wholesalers and bankers was held early in August and the trip outlined for September. The itinerary is to include the leading Far Eastern ports. R. W. Frame, vice-chairman of the Northwest products committee, presided at the preliminary meeting. Manuel Rustia, commercial attache at Seattle for the Philippines, assured the group of complete co-operation from the island government. M. Matsumoto pledged Japanese assistance to help make the tour a success.

ANOTHER RECORD

When the Panama-Pacific Line steamer Finland arrived at New York on August 13 eastern importing houses enjoyed a swift delivery of consignments from Oriental ports. The Finland carried 600 measurement tons of Oriental products and landed this cargo at New York on the thirty-third day after it had left Yokohama. This stands as a remarkable record, the average time for steamers from the Orient to New York, via Panama, being 44 days.

The freight was handled through transfers at Seattle and San Francisco. Three vessels helped hang up the spee drecord. The goods left Yokohama July 11 for Seattle on the Admiral-Oriental Line steamer President Grant, from Seattle to San Francisco it was carried on the fast coastwise liner H. F. Alexander, and at San Francisco the shipment was lifted by the Finland on July 26, this well-known carrier completing the rapid relay to Manhattan.

This performance forecasts a development when West Coast ports will participate in Oriental traffic for New York in competition with direct services. The use of the Panama Canal and the consequent shortening of the voyage from the Orient to New York made the latter port a serious competitor of the West Coast ports for the handling of Oriental cargo, as by direct shipment New York could save time over the coast route. The situation having now been reversed, it is expected that for certain classes of freight, when prompt connections can be assured at San Francisco, the Panama-Pacific Line will be a favored route.

PACIFIC MARINE REVIEW'S
INTERCOASTAL-OFFSHORE-COASTWISE
DIRECTORY
LINES SERVING PACIFIC COAST PORTS

INTERCOASTAL

SAN FRANCISCO

AMERICAN-HAWAIIAN S. S. CO.
215 Market street. Phone Douglas 9560.
FREIGHT ONLY
SAILINGS—Weekly from Seattle, Tacoma, Portland, San Francisco, Oakland, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Garfield 4300.
PASSENGERS AND FREIGHT.
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles, and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between San Francisco, Seattle, Vancouver, B. C., Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

GARLAND STEAMSHIP CORP.
444 California street. Phone Garfield 4200.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between San Francisco, Seattle, and Los Angeles and Norfolk, Baltimore, and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles, via Panama Canal to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
311 California street. Phone Douglas 7610.
FREIGHT ONLY
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles, to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Co., Pacific Coast agts.
215 Market street. Phone Kearny 2100.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight.
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Manzanillo, Los Angeles, San Francisco.
SAILINGS—Direct Freight Service.
Every 7 days. Eastward calls: San Francisco, Los Angeles. Westward: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARRIBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Offices: 465 Market street. Phone Douglas 8660.
Freight and Operating Offices: Pacific Steamship Co., 460 California St. Phone Sutter 3600.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma

TRANSMARINE LINES
W. D. Benton, Pac. Coast Mgr.
311 California street. Phone Garfield 4200.
FREIGHT ONLY
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED-AMERICAN LINES, INC.
S. Aoki, Gen. Agt. Pacific Coast Agency.
230 California street. Phone Garfield 2646.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Panama Canal, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
A. E. Zipf, Pacific Coast manager.
170 California street. Phone Douglas 1670.
FREIGHT ONLY.
SAILINGS—Intercoastal.
[illegible]

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Dearborn, agent.
Mutual Life Bldg.
FREIGHT ONLY
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles [illegible] New York, Panama Canal, [illegible]
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles [illegible]

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Alaska Pacific House Ellis at 2d.
FREIGHT ONLY.
SAILINGS—Every 14 days between Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, [illegible]
FREIGHT ONLY
SAILINGS—Intercoastal Service.
Regular sailings between [illegible] Seattle and New York, Boston, Providence, Philadelphia, Baltimore, [illegible] and Norfolk.

GARLAND STEAMSHIP CORP
[illegible]
FREIGHT ONLY
SAILINGS—[illegible]

NIVISON PROMOTED

T. E. NIVISON, for twelve years in service of the Federal Telegraph Company, is now sales manager of the marine department, with headquarters in the Hobart building, San Francisco, his appointment having been recently announced by Ellery W. Stone, president. Mr. Nivison is well known in Pacific Coast shipping circles. For the past seven years he was manager of the Los Angeles office, five years prior to that time having been in charge of the Portland office. Mr. Nivison has specialized in both the Kolster radio compass and marine radio equipment of the Federal Telegraph Company. An outstanding display feature of the recent Pacific Radio Exposition held in San Francisco was the exhibit of the Federal Telegraph Company, demonstrating the Kolster radio compass and the new C. W. and spark marine radio equipment and the high speed transmitter used by the Federal Telegraph Company in handling messages between Pacific Coast cities.

ADMIRAL LINE

David Whitcomb, president of the Seattle Chamber of Commerce, was recently elected a director of the Pacific Steamship Company at a special meeting of the board in Seattle. The Pacific Steamship Company, which owns and operates a total of twenty-four vessels in the Pacific Coast and Alaska trades, recently entered into an agreement with the Panama-Pacific Line, which gives it a fast freight and passenger service through the Panama Canal to New York. The board comprises: H. F. Alexander, Chester Thorne, E. A. Stuart, J. D. Hoge, R. P. Butchart, M. A. Arnold, A. F. Haines, Judge B. S. Grosscup, E. C. Ward, E. H. Hall, R. Stanley Dollar, Robert Dollar, D. C. Jackling, W. C. Morrow and David Whitcomb.

INTERCOASTAL

San Francisco, Los Angeles and Norfolk, Baltimore, and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents, Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
L. C. Smith Building. Phone Elliott 1206.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
Pier 6. Phone Elliott 5367.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco, Portland, Tacoma and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
Lobby 4 Central. Phone Elliott 6383.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA-PACIFIC LINE
International Mercantile Marine Company.
Passenger Office, 619 Second avenue.
Pacific Steamship Company, agents.
L. C. Smith Building. Phone Elliott 2068.
SAILINGS—Intercoastal.
Regular intervals between New York, San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
Transmarine Corporation.
4421 White Building. Phone Elliott 6127.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, agents.
Arctic Club Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
Spokane street terminal. Phone Elliott 6657.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, and New York, Philadelphia, Norfolk and Baltimore.

LOS ANGELES

AMERICAN-HAWAIIAN S. S. CO.
W. S. McPherson, agent.
Central Building. Phone 821-336.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks from Vancouver, Seattle, Portland, San Francisco and Los Angeles to New York, Boston, Providence, Philadelphia and Baltimore.

DOLLAR STEAMSHIP LINE
212 Mortgage Guarantee Bldg., 108 So. Spring St. Phone 574-891.
PASSENGERS AND FREIGHT
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles and San Francisco.
FREIGHT ONLY.

SAILINGS—Intercoastal Service.
Sailings between Los Angeles, San Francisco, Seattle, Vancouver, Portland, New York, Boston, Baltimore, Philadelphia, Norfolk and Florida ports.

GARLAND STEAMSHIP CORP.
General Steamship Corporation, Ltd.
Pacific Electric Building. Phone TRinity 3344.
FREIGHT ONLY.
SAILINGS—Intercoastal.
San Francisco, Seattle, Vancouver, Portland, Boston, Baltimore, Philadelphia, New York and Norfolk.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company.
208 West Eighth street. Phone Main 808.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 14 days from Vancouver, Seattle, Portland, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
Lane Mortgage Building. Phone Metropolitan 6141.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

PACIFIC MAIL STEAMSHIP CO.
Passenger Offices: 503 South Spring street.
Freight Office: 108 West Sixth street.
SAILINGS—Passengers and Freight.
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Baltimore, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Los Angeles and San Francisco.
SAILINGS—Direct Freight Service.
Every 7 days. Eastward calls: San Francisco, Los Angeles, Westbound: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
488 Pacific Electric Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA-PACIFIC LINE
International Mercantile Marine Company.
Freight Offices: Pacific Steamship Company, 322 Citizens National Bank.
Passenger Offices: 311 S. Spring st. Phone 827-311.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
(Transmarine Corporation)
G. T. Dougherty, agent.
A. G. Barrett Co., Inc., Pier [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED AMERICAN LINES, INC.
Los Angeles Steamship Company, agents.
417 Grand Ave.
FREIGHT ONLY.
SAILINGS—Weekly between New York and Los Angeles, San Francisco, Portland, Seattle and Tacoma.

WILLIAMS LINE
Williams Steamship Company.
Stock Exchange Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, and New York, Philadelphia, Norfolk and Baltimore.

PORT WORK

Leonard Martin Cox, member of the American Society of Civil Engineers and retired captain in the Corps of Civil Engineers of the U. S. Navy, announces his entrance into professional practice in offices occupied jointly with the C. E. Grunsky Company, consulting engineers at 57 Post street, San Francisco. Mr. Cox will specialize in harbor and port terminal projects, waterways, graving and floating docks, shipyard plants, and general maritime engineering.

S. F. GUESTS

W. M. Brittain, director of the export and import bureau, and J. J. Baker, head of the foreign and domestic bureau, of the Baltimore Chamber of Commerce, were recently in San Francisco studying waterfront conditions. Through the San Francisco Chamber of Commerce and Charles H. Spear, president of the State Board of Harbor Commissioners, they were extended courtesies along the Embarcadero.

WILLIAMS LINE

A. F. Zipf, Pacific Coast manager of the Williams Steamship Line, announces that his company has changed its New York terminal from Erie Basin to Pier No. 39, North River, foot of Houston street. Williams intercoastal steamers making direct Manhattan delivery, effective with the westbound sailing of the Willsolo, September 1. Mr. Zipf states that this is a permanent arrangement for all east and westbound vessels. The change in terminals was arranged in interest of California shippers of canned goods and dried fruits and the new terminal provides delivery in the heart of the Manhattan distributing center.

SCOTT VALVE

H. L. Woolfenden has joined the staff of the Scott Valve Manufacturing Company of Detroit and will have charge of sales promotion. Mr. Woolfenden is a graduate mechanical and electrical engineer, having received both degrees from the University of Michigan. After several years spent as a consulting engineer at Detroit, he went to Denver in 1901 and engaged in engineering and contracting. Later becoming associated with the Allis-Chambers Manufacturing Company, Woolfenden while district manager at Denver had charge of all sales and engineering work in the Rocky Mountain district.

INTERCOASTAL

PORTLAND

AMERICAN-HAWAIIAN S. S. CO.

C. D. Kennedy, agent.
Railway Exchange Building.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Seattle Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE

Norton, Lilly & Company, general agents.
400 Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Portland, New York, Boston, Providence, Philadelphia and Baltimore.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES

Luckenbach Steamship Company, Inc.
Spalding Building. Phone Broadway 4378.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 14 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE

McCormick Steamship Company.
181 Burnside street. Phone Broadway 1498.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland and Seattle.

PACIFIC MAIL STEAMSHIP CO.

Norton, Lilly & Co., agents.
Yeon Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days. Eastward calls: San Francisco, Los Angeles. Westbound: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland, and Seattle.

PACIFIC-CARIBBEAN GULF LINE

Swayne & Hoyt, Inc., managers.
1608 Spalding Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE

International Mercantile Marine Company.
Pacific Steamship Company, freight agents.
Admiral Line Terminal.
SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

UNITED AMERICAN LINES, INC.

Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

VANCOUVER

ARGONAUT STEAMSHIP LINE

B. W. Greer & Son, Ltd.
602 Hastings St., West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia and Baltimore.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 5420.
FREIGHT ONLY.
SAILINGS—Every 30 days, Vancouver to Montreal. Through bills of lading from other Pacific Coast ports.

DOLLAR STEAMSHIP LINE

Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Vancouver, B. C., Seattle, San Francisco, Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

ISTHMIAN STEAMSHIP LINES

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia and Baltimore.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES

Empire Shipping Company, Ltd.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 14 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE

Kingsley Navigation Company, Ltd.
602 Pacific Building. Phone Seymour 9306.
FREIGHT ONLY.
SAILINGS—Intercoastal
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco and South Pacific Coast ports.

PACIFIC-CARIBBEAN GULF LINE

[illegible]
FREIGHT ONLY.
SAILINGS—[illegible] North Pacific ports, San Francisco, Los Angeles, New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports.

ORIENTAL

SAN FRANCISCO

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

[illegible]
2 Pine street. Phone Sutter 4[illegible]
FREIGHT ONLY
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, Manila, [illegible] connecting via Victoria, B. C.

DOLLAR STEAMSHIP LINE

The Robert Dollar Co.

[illegible]

PASSENGER AND [illegible]
SAILINGS [illegible]

FREIGHT ONLY.
SAILINGS [illegible]

[illegible]

NORTHERN PUMP

Northern Pump Company, Division of the Northern Fire Apparatus Company, will hold a sales convention in Minneapolis September 24 to 26, inclusive. Nineteen Northern representatives, who have sold pumps to many of the largest oil companies in America and to the United States Government for handling oils, molasses, water, and have solved a number of problems for pumping engineers, will attend this important Minneapolis meeting, which has been called as a result of the rapidly increasing sale of the Northern rotary pump throughout the world. From the initial production of one pump in 1916 the Northern output for 1923 shows 600 pumps manufactured and sold. The present year points to a basis of 800 units. Here are the Northern men visiting Minneapolis: J. A. Hense, New York City; F. E. Robinson, Cleveland; W. C. Graham, New Orleans; E. E. Wagner, Tulsa; F. S. Rice, Los Angeles; Colonel Dan T. Moore, Houston; E. W. Sturtevant, Chicago; G. H. Ford, Dallas; H. M. Stark, Detroit; Herman Seelbach, Buffalo; H. W. Reisinger, Pittsburgh; H. L. Shepard, Portland, Oregon; F. H. Hayes, Boston; A. St. Amand, Charleston, South Carolina; H. E. Quirk, St. Louis; Lyman S. King, Remi C. Knight, and E. N. Britton, San Francisco.

FIRE MENACE

Owing to the menace of fire to piers and property on San Francisco's waterfront, Charles H. Spear, president of the State Board of Harbor Commissioners, has issued orders to all police to arrest anyone smoking on the piers.

ROYAL MAIL

The Royal Mail Steam Packet Company has selected San Francisco as its headquarters to supervise all passenger traffic developing from the Pacific Coast for its service and affiliated lines, such as the Panport & Holt Line, Pacific Steam Navigation Company, Union Castle Line and Nelson Line. The company's direct service from California to Europe via Panama, together with the connections at this port has carried a large [illegible] tourists to the Britishers during the year. A. G. Ames [illegible] San Francisco [illegible] Pacific Coast [illegible] with [illegible] the Royal Mail [illegible]

ORIENTAL

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
Merchants Exchange Bldg. Phone Sutter 3414.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NIPPON YUSEN KAISHA

Dodwell & Company, Ltd., agents.
2 Pine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Regular service between China, Japan ports and United States Atlantic ports via Panama Canal, vessels calling at San Francisco on both outward and homeward voyages. One arrival monthly from Japan, discharging cargo at San Francisco. One to two sailings monthly homeward, occasionally loading cargo for Yokohama, Kobe and Shanghai.

OSAKA SHOSEN KAISHA

McCormick, McPherson & Lapham.
503 Market street. Phone Kearny 3632.
SAILINGS—San Francisco Service (FREIGHT ONLY).
Monthly service to and from Yokohama, Kobe, Moji, Shanghai, Hongkong and Singaporean Ports.
SAILINGS—Los Angeles Service (PASSENGERS AND FREIGHT).
A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, the Panama Canal and Los Angeles.

PACIFIC MAIL STEAMSHIP CO.

508 California street. Phone Sutter 3300.
(Operating U. S. S. B. vessels.)
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific Service.
Every 14 days from San Francisco to Honolulu, Yokohama, Kobe, Shanghai, Manila and Hongkong.
SAILINGS—Hongkong-India (Freight Only.)
Connection at Hongkong every 2 weeks for India ports.

ROOSEVELT-KOKUSAI LINE

General Steamship Corporation, agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—At frequent intervals from San Francisco and Los Angeles to Yokohama, Kobe, Shanghai, Hongkong and other Oriental ports.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels.)
112 Market street. Phone Sutter 7640.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular intervals from Los Angeles, San Francisco, thence direct to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Darien, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
549-51 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Twice a month between San Francisco, Honolulu, Yokohama, Kobe, Nagasaki, Shanghai and Hongkong.
SAILINGS—Monthly to China and Japan on steamers from the West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
222 Robert Dollar Bldg. Phone Garfield 3899.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Stuart Building. Phone Elliott 0147.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

DOLLAR STEAMSHIP LINE

Admiral Oriental Line, agents.
L. C. Smith Building. Phone Elliott 0794.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular sailings North Pacific Coast ports to Shanghai, Kobe, Hongkong and Manila, returning via Los Angeles and San Francisco.

R. T. JOHNS & COMPANY

R. T. Johns & Company, agents.
Central Building. Phone Elliott 7262.
FREIGHT ONLY.
SAILINGS—Tramp service between Seattle and Oriental ports of Yokohama, Kobe, Nagova, Shimidzu and Moji.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
American Bank Building. Phone Elliott 1450
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco, Portland, Seattle and Puget Sound ports, thence to China and Japan.

NIPPON YUSEN KAISHA

Colman Building. Phone Elliott 3514.
PASSENGERS AND FREIGHT.
SAILINGS—Frequent intervals, calling at Victoria or Vancouver, B. C., Yokomama, Kobe, Nagasaki, Shanghai, Hongkong or other Oriental ports as inducements offer.

OSAKA SHOSEN KAISHA

W. C. Dawson & Company, agents.
Mutual Life Building. Phone Elliott 0442.
PASSENGERS AND FREIGHT.
SAILINGS—Regular Shanghai service to Yokohama, Kobe, Moji, Darien, Shanghai, Manila and Hongkong.

SUZUKI & COMPANY

Colman Building. Phone Main 768.
FREIGHT ONLY.
SAILINGS—Irregular service between Seattle and Japanese ports.

THORNDYKE-TRENHOLME CO.

L. C. Smith Building. Phone Main 3168.
FREIGHT ONLY.
SAILINGS—Regular service between Puget Sound, Grays Harbor, Portland and Yokohama, Kobe, Osaka and Nagoya.

WALKER-ROSS, INC.

L. C. Smith Building. Phone Elliott 174.
FREIGHT ONLY.
SAILINGS—Regular service between Seattle and Yokohama, Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
Central Bldg.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Seattle to Yokohama, Kobe, Osaka and Nagoya.

SEATTLE

ADMIRAL ORIENTAL LINE

L. C. Smith Building. Phone Elliott 2668.
SAILINGS—PASSENGERS AND FREIGHT.
Every 12 days between Seattle, Victoria, B. C., Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—FREIGHT ONLY.
Regular service to Vladivostok, Dairen, Tientsin, Tabu Bar, Tsingtao, Shanghai and Japan ports on either outward or homeward voyages, as freight offers justify direct call.
SAILINGS—Monthly service to Yokohama, Kobe, Shanghai, Foochow, Amoy, Swatow, Manila, Cebu and Iloilo.

LOS ANGELES

CANADIAN GOVERNMENT MERCHANT MARINE

[illegible]
412 [illegible]
[illegible]
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver, B. C., Yokohama, Kobe, Shanghai, Manila, China ports, returning via Los Angeles and San Francisco.

DOLLAR STEAMSHIP LINE

[illegible]
PASSENGERS AND FREIGHT
SAILINGS [illegible]
[illegible]
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings [illegible]
Kobe, Shanghai, Hongkong, Manila.

OSAKA SHOSEN KAISHA

[illegible]
PASSENGERS AND FREIGHT.
SAILINGS [illegible]
Kobe, [illegible]

VETERAN DEAD

Captain Charles F. Peterson master of the Alaska Packers' ship Star of Lapland, was found dead aboard his vessel July 30. Heart failure is thought to have claimed the well-known master. Captain Peterson lived at 1626 Encinal avenue, Alameda. He is survived by his widow.

SEES NORTHWEST

Captain Luther B. Dow, manager and counsel of the American Steamship Licensed Officers' Association, Inc., of New York, was a recent visitor to the Pacific Northwest ports. Captain Dow was the guest of his son, Wilbur E. Dow, customs agent and broker of Seattle. He inspected the Puget Sound shipping centers and was much interested in the Lake Washington canal locks.

GARLAND LINE

The Garland Steamship Company is now conducting its San Francisco business with the General Steamship Corporation as agents, having closed its own office, according to an announcement by William Campion, vice-president and general manager. The Garland has seven ships in the intercoastal run.

RICHMOND PIER

Earnings of the Richmond, California, municipal wharf for the month of July were $2618.40, according to a report filed by Harbor Master J. H. Misner. Fourteen vessels used the dock and 16,656 tons of cargo were handled.

ROUND-THE-WORLD

R. Stanley Dollar, president of the Admiral-Oriental Line and vice-president of the Dollar Steamship Line, is en route around the world on the Dollar liner President Harrison. All points served by the Dollar Steamship Line round-the world service will be visited by this widely known shipping executive. Captain Robert Dollar circled the globe early in the year in interest of the new route.

MATSON MEETING

All port superintendents of the Matson Navigation Company in Hawaii are attending a conference in San Francisco. Those at the gathering are: Captain James Rasmussen, Honolulu; Charles A. Drew, manager of the Honolulu agency; Captain Thomas E. Fox, Hilo; William Walsh, Kahului; Captain George B. Leavitt, Port Allen; Adrian Englenard, Ahukini; and E. Madden, Mahukona.

ORIENTAL

Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, Panama Canal and Los Angeles.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels.)
701-02 Transportation Bldg. Phone Tucker 3969.
FREIGHT ONLY.
SAILINGS—Regular intervals from Los Angeles and San Francisco, thence to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Darien, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
S. L. Kreider, agent.
375 Pacific Electric Bldg. Phone TRinity 6556.
PASSENGERS AND FREIGHT.
SAILINGS—Regular sailings from China and Japan via San Francisco on steamers of Japan, Hongkong, San Francisco line.
SAILINGS—Monthly to Oriental ports via San Francisco on steamers from West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

PORTLAND

AMERICAN ORIENTAL SERVICE

A. M. Gillespie, Inc., agent.
Board of Trade Bldg. Phone Broadway 4348.
SAILINGS—Monthly to ports of Japan and China as inducements offer.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
702 Wilcox Building. Phone Main 4113.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NORTH CHINA LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Taku Bar and Darien.

PORTLAND-ORIENT LINE

William A. Cook, [illegible]
Porter Building. [illegible] Broadway 3344
SAILINGS—From Portland to Yokohama, Kobe, Shanghai, Hongkong, Taku Bar, Darien, Vladivostok.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
Oregon-Pacific Line, agents, Inc.
203-4 Wilcox Building. Phone Bdwy. 4529.
FREIGHT ONLY.
SAILINGS—Monthly from Portland to Oriental ports.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

SOUTH CHINA LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Broadway 2367.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Portland to Yokohama, Kobe, Hongkong and Manila.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company.
1109 Porter Building.
FREIGHT ONLY.

SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Yorkshire Building. Phone Seymour 9370.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.

CANADIAN PACIFIC STEAMSHIPS, LTD.

Canadian Pacific Railway Station. Phone Seymour 2680.
PASSENGERS AND FREIGHT.
SAILINGS—Every 14 days from Vancouver to Japan and China, Shanghai, Hongkong and Manila.

DOLLAR STEAMSHIP LINE

Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8690.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings from New York, Boston, Baltimore, Philadelphia, Norfolk, Portland and Vancouver to Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles and San Francisco.

NIPPON YUSEN KAISHA

R. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2977.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Vancouver and ports in Japan, China and Philippines.

OSAKA SHOSEN KAISHA

Empire Shipping Company, Ltd.
815 Hastings St., W. [illegible]
5444
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks [illegible] ports in Japan, China, Straits Settlements, Singapore, Java, Manila, etc.

SUZUKI & COMPANY

R. L. Johns & Wilson, Company, Ltd.
327 Hastings W. [illegible]
FREIGHT ONLY.
SAILINGS—Irregular sailings between Pacific Coast ports and Japan ports.

WALKER-ROSS, INC.

Canadian Australasian Shipping Company, Ltd.
[illegible]
FREIGHT ONLY.
SAILINGS—Regular service to Yokohama, Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO KAISHA

[illegible]
FREIGHT ONLY.
SAILINGS—Every 2 weeks to Yokohama, Kobe, Osaka and Nagoya.

UNITED KINGDOM---CONTINENTAL EUROPE

SAN FRANCISCO

BLUE FUNNEL LINE

Ocean Steamship Company as 3 China Mutual Steam Navigation Company, Ltd.
2 Pine street. Phone Sutter 4271.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Ltd.
433 California street. [illegible]
PASSENGERS AND FREIGHT
SAILINGS—[illegible]
[illegible]

ELLERMAN & BUCKNALL STEAM SHIP CO., LTD.

Norton Lilly & Company, Inc.
[illegible]
FREIGHT ONLY

KOLSTER COMPASS

George O. Swartout, Kolster radio compass engineer for the Federal Telegraph Company, is now on the Great Lakes supervising the calibration of the compensating devices on the Kolster radio compasses aboard the two new Ford ore carriers. These carriers are the largest diesel-driven freighters in the world.

DOLLAR LINE

The Dollar Steamship Line is distributing a beautiful new folder entitled "California Via Havana and the Panama Canal." In addition to a complete description of the attractions of a water trip from coast to coast, Dollar Steamship Line's round-the-world service is pictured for the prospective traveler. This latest piece of literature is one of the most complete folders of the year.

TODD SALES

R. R. Row, formerly president of the firm of Row and Davis, is now director of sales for the Todd Shipyards Corporation, with headquarters at 25 Broadway, New York, according to a recent announcement. Mr. Row will handle the sale and distribution of the several manufactured products known as Todd specialties.

NEW OFFICES

Captain Warren F. Mills, marine and cargo surveyor, widely known in shipping circles for many years, announces the removal of his offices from 354 Pine street to 255 California street, San Francisco. Captain Mills, son of the late famous Captain Harvey Mills, recently produced a remarkable life-boat launching system, which will attract a universal range of attention.

ON COAST TOUR

Paul Nolze, agent at Bremen for the Roland Line, was recently in Pacific Coast ports, and inspected the facilities of the Columbia-Pacific Shipping Company at Portland. This Oregon firm represents the United American Line, whose fleet includes a number of Roland Line steamers.

BAY FERRIES

Work on the slips of the Richmond-San Francisco ferry at Richmond, Cal., is proceeding rapidly. Following the arrival of new dredging equipment, which is being used in clearing the approach to the slips, The Southern Pacific Company hopes to have this new facility operating by October 1.

UNITED KINGDOM---CONTINENTAL EUROPE

SAILINGS—Service between Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation, subagents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
710 Balfour Building. Phone Sutter 647S-6479.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports when inducements offer.

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
351 California street. Phone Sutter 6437.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES

E. C. Evans & Sons, agents.
260 California street. Phone Douglas 8040-1-2.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego, to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Co., general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint service of the Royal Mail Steam Packet Company and Hollland America Line.)
401 Market street. Phone Douglas 7510.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

NORWAY PACIFIC LINE

485 California street. Phone Sutter 5099.
FREIGHT ONLY.
SAILINGS—From San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia. Sailings every 10 days.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 2500.
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.

Sudden & Christenson, Pacific Coast Agents.
230 California street. Phone Garfield 2846.
For passenger sailing, see page 40.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SEATTLE

BLUE FUNNEL LINE

Dodwell & Company, Ltd., agents.
Stuart Building. Phone Elliott 0147.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.
823 Alaska Building. Phone Elliott 9104.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports direct to Hamburg, Hull Gothenburg, Copenhagen, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Service between Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation.
Colman Building. Phone Elliott 5706.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

(Furness, Withy & Company Ltd.)
Furness (Pacific), Ltd.
Burchard & Finken, agents. 705 Arctic Bldg.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 5706.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
Stuart Building. Phone Elliott 1464
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings every 3 weeks.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego, to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Company.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint Service of the Royal Mail Steam Packet Company and Holland America Line.)
204-205 Rainier Building. Phone Elliott 4944
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.

Sudden & Christenson, agents.
Arctic Club Bldg.
PASSENGERS AND FREIGHT.
SAILINGS—North-Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

HAVISIDE III

The name of Haviside has been so long and so actively before the marine fraternity that it has become synonymous with the art of rigging Pacific Coast vessels. J. J. Haviside, Jr., associated in The Haviside Company, San Francisco, recently announced the sale of his interest in the firm to his brother, who will take his two sons, Russell and Byron, into partnership. The passing of the interest to the sons of Harry Haviside brings the third generation of the family into the ship-rigging work. The firm was established in 1868 under the name of J. J. Haviside & Company. As the sons of the founder reached maturity they joined their father in upbuilding the business. After the fire of 1906 J. J. Haviside, Sr., retired and the sons reorganized the house under the name of The Haviside Company. With the evolution of ships and shipping The Haviside Company expanded. Today its equipment for rigging operations and general chandlery department are among the most complete and efficient in western maritime trade. No mast or spar presents difficulty with Haviside on the job. With Harry Haviside's boys carrying on, the usefulness of the famous firm should stride further forward on the flood tide of Pacific Coast development.

JONES TO EUROPE

J. S. Jones, vice-president of Chas. Cory & Son, Inc., sailed on the steamer George Washington early in August to attend the British Empire Exposition at Wembley. While abroad he will investigate the marine and industrial condition.

The oil engine-electric tug Van Dyke II was launched recently by the Staten Island Shipbuilding Company, Staten Island, New York. This is the second of three oil engine electric tugs building for the Atlantic Refining Company of Philadelphia. The first tug, the Van Dyke I, was launched June 7. Each tug will be equipped with two 225 horsepower Ingersoll-Rand Price-Rathbun oil engines direct-connected to General Electric generators and driven by a General Electric motor.

CALLING OAKLAND

Los Angeles Steamship Company's fast turbiners Yale and Harvard are now including Oakland, California, in the schedule, offering express freight and passenger service between San Francisco harbor and Los Angeles.

UNITED KINGDOM---CONTINENTAL EUROPE

LOS ANGELES

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company.)
Dodwell & Company, Ltd.
412 Union Oil Building. Phone Broadway 7900 and Vandike 4944.
FREIGHT ONLY.
SAILINGS—Every 6 weeks from North Pacific Coast ports, including San Francisco and Los Angeles to London, Liverpool and Glasgow via Panama Canal.

EAST ASIATIC COMPANY, LTD.
Balfour, Guthrie & Company, agents
315 Union Oil Bldg. Phone 822-434.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.
Norton, Lilly & Company, general agents
626 Van Nuys Bldg. Phone HE 3511-44.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique)
General Steamship Corporation, agents
541 South Spring street.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness Withy & Company, Ltd.)
Swayne & Hoyt, Inc., agents.
488 Pacific Electric Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco, Los Angeles to Manchester, Glasgow, Liverpool, Leith, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
541 South Spring street.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Baltic ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company, agents
315 Union Oil Bldg. Phone HE 3511-44.
FREIGHT ONLY
SAILINGS—Regular service from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom from August 1st to October 31st. Port rates fix

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents
626 Van Nuys Bldg. Phone HE 3511-44.
FREIGHT ONLY
SAILINGS—Pacific-United Kingdom Service. Every [illegible] from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Manchester, Liverpool, Glasgow and other United Kingdom ports as inducements offer.

JOHNSON LINE
M. L. & R. Abel
400 Pine Street, San Francisco. Phone Davis 4-100
PASSENGERS AND FREIGHT
SAILINGS—Monthly between Pacific Coast ports and Belgian, German and Scandinavian ports. Mixed cargoes. Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Danish Nortfarel Line and Royal Mail Steam Packet Co.)
C. H. Lehmann, agent.
123 E. Sixth Street. Phone Trinity 5171
PASSENGERS AND FREIGHT
SAILINGS—Every [illegible] weeks between Vancouver, Seattle, Portland, Astoria, San Francisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg

NORWAY PACIFIC LINE
703 Pedro Vergez street, San Pedro.
FREIGHT ONLY.
SAILINGS—Four motorships operating from San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia. Sailings every 30 days.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents
626 Van Nuys Bldg. Phone HE 3511-44.
FREIGHT ONLY.
SAILINGS—Service from Vancouver, Seattle, Portland, San Francisco and Los Angeles to Marseille and Continental ports direct.

UNITED AMERICAN LINES, INC.
Los Angeles S. S. Company, agents
407 Central Building.
PASSENGERS AND FREIGHT
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

PORTLAND

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.)
PASSENGERS AND FREIGHT
SAILINGS—Every 6 weeks from North Pacific ports, including San Francisco and Los Angeles and London, Liverpool and Glasgow

EAST ASIATIC COMPANY, LTD.
Chalmers & Cartwright, Inc., agents
Porter Building. Phone Broadway 4[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—Regular service from Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with transshipment at Hull to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.
Norton, Lilly & Company, general agents
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique)
(General Steamship Corporation, agents)
Public Service Building.
FREIGHT ONLY
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Public Service Building.
Portland, Oregon.
PASSENGERS AND FREIGHT.
SAILINGS—From Portland, San Francisco, Los Angeles to Manchester, Glasgow, Liverpool, Leith, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
[illegible]
FREIGHT ONLY
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Baltic ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company, agents
315 Public Service Building.
FREIGHT ONLY.
SAILINGS—Regular service from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom from August 1st to October 31st. Port rates fixed.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY
SAILINGS—Pacific-United Kingdom Service. Every [illegible] from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Manchester, Liverpool, Glasgow and other United Kingdom ports as inducements offer.

JOHNSON LINE
M. L. & R. Abel
Public Service Building.
Portland, Oregon.
PASSENGERS AND FREIGHT
SAILINGS—Monthly between Pacific Coast ports and Belgian, German and Scandinavian ports. Mixed cargoes. Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Danish Nortfarel Line and Royal Mail Steam Packet Co.)
C. H. Lehmann, agent.
Oregon Building.
Portland, Oregon.
PASSENGERS AND FREIGHT
SAILINGS—Every [illegible] weeks between Vancouver, Seattle, Portland, Astoria, San Francisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg

Ports of Oregon

Portland. The shipments of grain and lumber out of Portland showed a material increase for the year ending June 30, 1924, over the corresponding period of 1923. During the twelve months ending June 30, 1924, the Port of Portland shipped a total of 387,225,412 feet of lumber to foreign ports and 245,790,091 feet to domestic ports; while 24,145,798 bushels of wheat and 1,979,254 barrels of flour were exported and 955,732 bushels of wheat and 742,361 barrels of flour were shipped to domestic ports during the same period.

The work of the Army Engineers of the Second Portland District, which has for four years been under the supervision of Major Richard Park, U. S. A., was taken over the first of August by Major Richard T. Comer, U. S. A. Major Park has done valued work in cooperation with the Portland engineers in developing the channels of the Columbia River and through his efforts this district has been greatly improved and made a safe harbor for all vessels.

Bulk grain loading machinery and towers on Albina Dock will be ready for operation September 1 by Kerr, Gifford & Company, the new installation permitting the loading of 400 tons an hour.

The Western Spar Company started construction the latter part of July of a 400-foot dock at Columbia City, below Portland, which dock will be used for loading lumber vessels.

ROUND-THE-WORLD

SAN FRANCISCO

DOLLAR STEAMSHIP LINE
[illegible]
PASSENGERS AND FREIGHT
SAILINGS
[illegible]
FREIGHT ONLY
REGULAR SAILINGS

LOS ANGELES

DOLLAR STEAMSHIP LINE
[illegible]
PASSENGERS AND FREIGHT
SAILINGS
[illegible]
FREIGHT ONLY
REGULAR SAILINGS

UNITED KINGDOM---CONTINENTAL EUROPE

cisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
Vose Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—From Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa; inducements offer

UNITED AMERICAN LINES, INC.

Columbia Pacific Shipping Company, agents.
Porter Building. Phone Exbrook 5760.
PASSENGERS AND FREIGHT
SAILINGS—North Pacific-European Service.
Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co. Ltd., agents.
Yorkshire Building. Seymour 6876.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 240.
FREIGHT ONLY.
SAILINGS—Monthly to Yokohama and Panama.

EAST ASIATIC COMPANY, LTD

B. F. Johnson, Wilson Orr & Co., Ltd.
837 Hastings St. W. Phone Seymour 6147
PASSENGERS AND FREIGHT
SAILINGS—Regular service, Pacific Coast ports direct to Bordeaux, Hull, Gothenburg, Copenhagen, with transhipment to all Scandinavian and Baltic port

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
FREIT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Hull, Leith and other United Kingdom and Continental ports as inducements offer. Has also lots of lading issued to Scandinavian, Baltic, Portuguese, Spanish Mediterranean and Levant ports active solicitation of

FRENCH LINE

Compagnie Generale Transatlantique.)
Empire Shipping Co., Ltd. Phone Seymour 8014
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver to Bordeaux, Havre, Antwerp and Hamburg.

FURNESS LINE

Furness Withy & Company, Ltd.
Furness (Pacific), Ltd.
1232 Marchant Bank Building.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Vancouver and other Pacific Coast ports to United Kingdom.

GENERAL STEAMSHIP CORP.

Empire Shipping Co., Ltd., 3 Hastings St., W.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—From Pacific Coast ports to United Kingdom and Scandinavia, as inducements offer

HARRISON DIRECT LINE

Balfour, Guthrie & Company, Ltd.
Phone Seymour 6650
FREIGHT ONLY.
SAILINGS—Steamers 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles direct to United Kingdom Irish Argentine Channel ports, Antwerp

ISTHMIAN STEAMSHIP LINES

B. W. Greer & Son, Ltd.
602 Hastings street West. Phone Seymour 2377
PASSENGERS AND FREIGHT.
SAILINGS—Pacific-United Kingdom Service.
Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth Dock and other United Kingdom ports as inducements offer.

JOHNSON LINE

C. Gardner Johnson & Company, Ltd.
Metropolitan Building. Phone Seymour 357.
PASSENGERS AND FREIGHT
SAILINGS Monthly between Pacific Coast ports and Bergen, Christiana, Gothenburg, Malmo, Copenhagen, Stockholm, and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint service of The Royal Mail Steam Packet Co. and Holland America Line.)
Royal Mail Steam Packet Co., general agents.
Pacific Building. Phone Seymour 2109
PASSENGERS AND FREIGHT
SAILINGS—Regular services between Vancouver, Puget Sound, Columbia River, San Francisco and Los Angeles and Liverpool, London, Rotterdam Antwerp, Hamburg.

PACIFIC MAIL STEAMSHIP CO.

508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight.
Twice a month between San Francisco, Los Angeles, calling at ports on West Coast of Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, and Taltal. (Other ports as inducements offer.)

TOYO KISEN KAISHA

(Oriental Steamship Company.)
549-51 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via Honolulu.

Mexico---Central America--Canal Zone---South America

SAN FRANCISCO

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
PASSENGERS AND FREIGHT
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

W. R. Grace & Company, general agents.
332 Pine street. Phone Sutter 7100
PASSENGERS AND FREIGHT
SAILINGS—Monthly from Seattle, Portland, Puget Sound, Pacific Coast ports to Balboa, Peru, Chile, Bolivia, Ecuador, Panama, Mexico, Central America and Cuba; inducements offer.

LATIN-AMERICA LINE

R. S. Naylor & Company, general agents.
140 Clay street. Phone Douglas 71
SAILINGS—Pacific Coast-Mexico-Central America
Monthly from Portland, Seattle and San Francisco to Balboa, on West Coast of Mexico and Central America ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Portland, Seattle and San Francisco to principal West Coast ports of South America as far south as Valparaiso

McCORMICK STEAMSHIP CO

215 Market street.
PASSENGERS AND FREIGHT
SAILINGS Every three weeks from San Francisco to San Jose del Cabo, La Paz, Guaymas, Topolobampo, Mazatlan, San Blas and Manzanillo.

MEXICAN FREE PORTS S. S. LINE

Williams, Dimond & Company, Agents.
316 Sansome St. Phone Sutter 7400
PASSENGERS AND FREIGHT
SAILINGS—Every 30 days from San Francisco and Los Angeles to the West Coast of Mexico

MEXICAN STATES LINE

Williams, Dimond & Company
316 Sansome St. Phone Sutter 7400
PASSENGERS AND FREIGHT
SAILINGS—Every 8 days from San Francisco to West Coast of Mexico and Central America.

PACIFIC LINE

The Pacific Steam Navigation Company
526 Market street. Phone Sutter 4672
PASSENGERS AND FREIGHT
SAILINGS—Regular service Panama Canal, Guayaquil, Callao, Mollendo, Arica, Iquique, Antofagasta, Valparaiso, Coquimbo, Corronel, also to Havana and New Yorke also via Cristobal and Havana to Spain, France and England. Steamers connect at Panama for Pacific Mail coast ports.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca

PACIFIC MAIL STEAMSHIP CO.

508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight.
Twice a month between San Francisco, Los Angeles, calling at ports on West Coast of Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, and Taltal. (Other ports as inducements offer.)

TOYO KISEN KAISHA

(Oriental Steamship Company.)
549-51 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via Honolulu.

SEATTLE

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 5706.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

W. R. Grace & Company, agents.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports of Peru and Chile as inducements offer.

LATIN AMERICA LINE

Lea Mathews Shipping Corporation.
Alaska Building. Phone Elliott 4567.
FREIGHT ONLY.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Seattle, Portland and San Francisco to all ports on West Coast of Mexico, and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Seattle, Portland and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc., managers.
Lumber Exchange Building. Phone Elliott 6383
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Ponce and San Juan (Porto Rico), Montevideo, Buenos Aires and Santos; also as inducements offer, Curacao, Para, Pernambuco, Bahia, Rosario and Bahia Blanca

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
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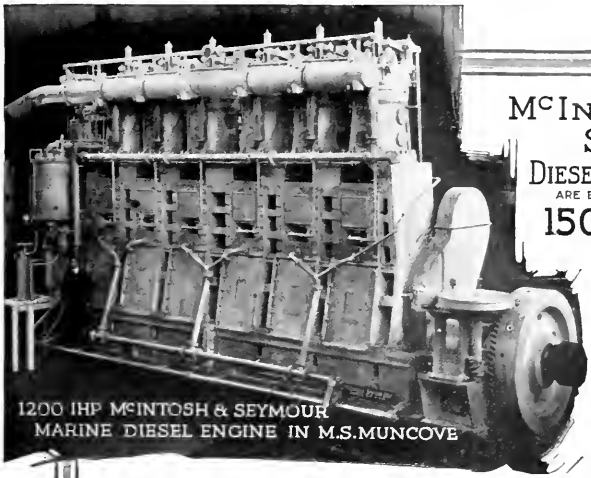

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SHIP OWNERS & OPERATORS

PLEASE STUDY THIS TABLE

	COAL FIRED STEAM VESSEL	CONVERTED TO MOTORSHIP WITH STEAM AUXILIARIES	CONVERTED TO MOTORSHIP WITH DIESEL ELECTRIC AUXILIARIES
Deadweight Tons	4125	4125	4125
Average Speed (Knots) . .	8.5	8	8
Average Fuel Per Day (Tons)	28	8	4½
Ton/Miles of Cargo per Dollar Fuel Cost	4300	9300	16,500

The above are actual results compiled from operating data of Sister Shipping Board Ships now operated by a prominent American shipping company.

THE MOTORSHIPS were fitted with

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BOOK REVIEWS

Marine Structures, Their Deterioration and Preservation, by William G. Atwood and A. A. Johnson. Oct. 534 pp., 169 Fig., 14 Pl. National Research Council, New York. Price $10. This book, which is a report of the Committee on Marine Piling Investigations of the National Research Council, is the first and only comprehensive and authoritative publication on this important subject which has appeared in the United States. The authors had unusual opportunities for securing the data used in its preparation. With the assistance and cooperation of the railways, several departments of the Federal government, a number of the leading chemists and biologists of the United States, and a number of foreign organizations and individual scientists, they were able to make many tests and carry on a large number of experiments in the waters surrounding the North American continent and in the harbors of the Pacific and Carribbean Islands and also to secure the results of many tests and inspections in foreign harbors.

The book begins with a description of the organization of the work, of the tests and experiments made, and the methods used in making them, with a summary of the results obtained.

The biological section of the report contains descriptions of the commoner species of marine borers which were known to attack timber, stone, or concrete, giving much information which will be readily understood by the engineer. This section also includes reprints of several scientific papers prepared by the biologists cooperating with the committee, in which will be found descriptions of previously unidentified species of shipworms. Tabulations showing the distribution and the economic importance of the various species are also included.

Many timbers produced principally in the tropics have been, from time to time, stated to be immune from the attack of borers. Many records of tests and service records of structures built with such timbers in all parts of the world are collected and analyzed and long time tests of the most promising of these timbers are listed.

Sixty-four pages are devoted to a study of the various methods which have been used for the protection of timber and recommendations are made as to the conditions under which the use of each of these methods should be considered. In this chapter there will be found collected a number of studies and analyses of creosoted material, several of which have not been previously published.

The chapter "Substitutes for Timber" contains service records and inspection reports for a large number of concrete and metal structures in all parts of the world. The conclusions drawn from these records depart somewhat from current engineering ideas and practice and will be found of great value to owners and engineers planning the construction of piers and wharves.

The Chemical Warfare Service of the Army submit a preliminary report of their investigations, which were planned to improve the methods and materials used for wood preservation. These studies are of great interest to both biologists and chemists and if the preliminary results are confirmed by further tests they promise to result in a reduction in the cost of preservation and an increase in its efficiency.

The experiments made in each harbor are described in detail in the chapter on "Harbor Reports", as well as the inspection of structures in which practically all known materials were used. The boring animals found in each harbor are listed and in many cases the period of the year in which they are active is stated. Recommendations are made as to the type of construction which will probably prove the most durable under the various conditions.

There is a bibliography with about 2100 titles and a good index.

Marine Engineering Practice, a manual on the design, construction, operation and maintenance of the engineering equipment of ships, by Engineer-Commander F. J. Drover, Royal Navy. 494 pages; 260 illustrations, including many folding plates; cloth bound, published by D. Van Nostrand Company, New York; price, $6.50.

"Marine Engineering Practice" is a real, practical guide for marine engineers, students, and all interested in this branch of engineering.

The book covers eight main topics; namely, Marine Boilers, Oil-fuel Burning, Reciprocating Marine Engines, Marine Turbines, Marine Condensers and Air Pumps, Marine Auxiliaries, Diesel and Semi-Diesel Engines, and Adjustments and Repairs. Each of these important subjects is covered in detail and in a thorough and practical way without any attempt at including theoretical or historical information, which while interesting, is no definite benefit to the practicing engineer.

This is the latest book on the subject and therefore gives much information covering engineering developments during the past two or three years. The book describes the best accepted practice and only the machinery and apparatus at present used except in rare cases where it has been necessary to introduce the earlier types to explain principles.

THE GOOD OLD DAYS OF STEAM

T. SQUARE NEEDS ADJUSTMENT
By WILLIAM E. VOLZ, M.E.

IN a late issue of your valuable paper your contributor, T. Square, refers to a designer's mistake in fitting feed water tubes into the upper part of a surface condenser, claiming that no possible advantage could be obtained by such an arrangement, as the temperature of the feed water could not be raised above the temperature due to the vacuum.

Many years ago the writer converted a large number of jet condensing steamers into surface condensing and found that in nearly every instance the temperature of the feed water entering boilers ranged anywhere from 10 to 15 degrees (and more in cold weather) below the normal temperature due to the vacuum. This loss was mainly due to the size of the hot well, which was usually designed for a capacity of 30 to 50 times the amount of steam condensed, and as in most cases the condensate passed through some type of oil filter, the heat recovered by a closed system of heater before entering boilers amounted to a considerable saving in fuel.

The writer then designed and obtained letters patent on a combined surface condenser and feed water heater, which was not only very successful on steam vessels, but extensively used in large power stations before the advent of the steam turbine, and was evidently copied by a number of builders, as T. Square's article would indicate.

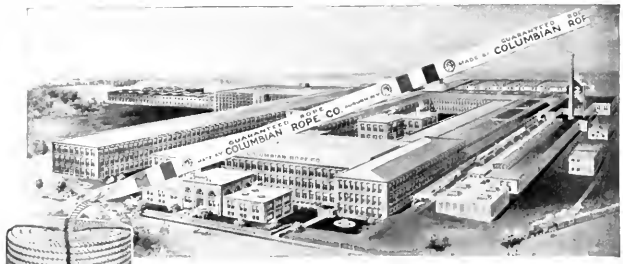
It is doubtful if the designer in his case claimed any rise in temperature over that due to the vacuum, but endeavored to prevent any heat losses of the condensate between hot well, filter, and boiler, and no doubt was guided by practical experience and operation, and not on theoretical lines, as the remarks of your correspondent would indicate.

The many marine and stationary installations on this system proved that the designer was right and T. Square wrong.

In another paragraph your correspondent mentions the total omission of bunker space in the design in Washington of a naval vessel.

As all United States naval vessels for the past twenty-five years have been designed by the Bureau of Construction and Repairs with the cooperation of the Bureau of Steam Engineering, I am curious to learn the name of this particular ship, as I cannot believe that such a glaring error could be made under the supervision of such men as Naval Constructors Wilson, Hichborn, Watt, Capps and Taylor, and Chief Engineers Melville and Griffin. Being familiar with most of the ships built by the Navy from the White Squadron to the dreadnought type, the only grave error remembered in design was the first Texas, the plans for this ship having been purchased abroad by Secretary Whitney and which had to be considerably altered during construction.

Some of the heads of the above bureaus have passed away, some retired, and those living would probably not care to disprove an anonymous statement, as made by your correspondent, which to my mind is a reflection on the engineering abilities of these gentlemen and the administration which selected these men for the best interests of the Navy.



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FROM IRON STEAMERS TO STEEL MOTORSHIPS

(Continued from page 462)

The yard equipment includes the following units:

Boiler Shop: This shop is equipped to build marine boilers of any size. The largest built to date were Scotch type boilers, 18 feet in diameter.

Machine Shop: Equipped with modern machinery, marine engines of practically any size can be built.

Blacksmith Shop: Equipped for anvil work and light machine forging.

Angle and Punch Shops: Heating furnaces, punches, rolls, etc., of sufficient size to take care of all the fabricating and work necessary in building steel cargo or tank vessels are provided.

Pipe and Light Metal Shop: A fully equipped sheet metal and copper shop. The first floor is given over to pipe work such as cutting, threading, and bending equipment. The second floor is divided into two sections, one of which is the copper shop, the other the sheet metal shop.

The copper shop is provided with the necessary brazing equipment, electric power hammer for drawing seams, bending, etc., band saws, etc.

In the sheet metal shop are bending rolls, shears, power brakes (for square bends and angles), wiring machine, swaging machine, electric spot welders, elbow turners, buffing machines and other related equipment.

All of the machinery is new and modern and adapted for all classes of ship work.

Rigging Loft: Equipped to handle all work in connection with ship and yacht building.

Mold Loft: This loft is over 400 feet long by 100 feet wide and has ample floor space to take care of all classes of work built in the yard.

Joiner Shop: This is an exceptionally large joiner and cabinet shop, due to the fact that wooden passenger coaches were formerly built at the plant. These have since given way to steel cars, with the result that the shop, fully equipped with modern machinery to do all classes of high grade wood work, is now used entirely for mill and cabinet work for marine or land installations and is prepared to handle any work of this character.

The wood working facilities should be of particular interest to the yachtsman or shipowner desiring high class interior finishing. An excellent grade of interior finish is made and at the time this article was written the shop was engaged on high class joiner and cabinet work for the two new passenger ships under construction for the Eastern Steamship Lines, Inc., for service between New York and Boston.

Reconditioning

The Harlan Plant not only specializes in the construction of steel vessels of all kinds, from large tankers down to ferry boats, tugs, lighters, dredges, car floats, barges, etc., but, as can be seen from the shop equipment, is particularly well adapted to repairing or reconditioning all classes of vessels, such as harbor and river steamers, lighters, yachts, as well as the larger cargo vessels, tankers, etc., having all the necessary facilities at hand for manufacturing and replacing parts for such craft. All kinds of repairs to hull, machinery, and auxiliaries on vessels of any size and type can be made.

The word "experience" can be and is frequently abused, but it is unquestionably true that there are few lines of construction work where long experience is a bigger asset than in yacht and ship building and that is where the Harlan Plant is unusually well equipped. Eighty and more years of continuous development and expansion could hardly fail to have resulted in building up an organization and strong nucleus of employes whose term of years has been long and experienced in their own respective lines, more than worth while when it comes to getting results. There are a number of "old timers" in all departments; men who have spent forty and more years of their life with the company. The assistant general manager, himself, has seen forty-nine years of service in the organization. Surely a record such as this speaks well, viewed in conjunction with the development of the plant and its activities, for the character of the management throughout all these years.

It is difficult to keep a description of a plant of this kind from being a mere recital of facts, and yet the visit made for the purpose of securing the material for this article was far from a routine or prosaic one. There is an intangible something about a shipyard that suggests the romance of the sea and the lover of the water and vessels of all kinds feels an immediate response.

After the detailed inspection of shops and ways and after a launch trip along the river front, we feel the need of getting a more detached bird's-eye view to add perspective to the intimate contact, and so we climb to the top of the 120-ton crane, 144 steps, nearly a hundred feet, up to the platform from which we get a splendid view not only of the yard but the surrounding country. Here, as we climb a little higher and walk out on the bridge, we feel afloat in the air and can in a detached way get the feeling of the plant and the locality in its relation to modern progress.

In the foreground lies the plumbing and sheet metal shops backed up by other buildings and shops, by the ship ways, and lastly by the sprawling outlines of the city of Wilmington with the low hills and tall buildings that rear themselves far above the rest, serving as a background. In one direction the Christiana flows quietly and silently by the city, across the flats whose

Shipbuilding slips at the Harlan plant

smoke from freight yards and factories dims the view, and finally joins itself with the Delaware, whose location is denoted by other trails of smoke from passing vessels. In the other direction it turns and twists back into the country, the green lowlands and trees standing out in striking contrast to drab immediate surroundings.

The wind is blowing hard and up on the crane it seems to be blowing even harder, but down below everything appears quiet, peaceful, and part of the landscape. It is hard to realize that a busy city and large manufacturing plants are so close at hand. On the heights the average human is prone to musing and speculation, which in turn brings retrospection. Here is country with a history. One has his choice. Up the Christiana, in the early day, came the Swedes, the pioneer settlers in this section. They had come up the Delaware, established their first settlement at Newcastle, that quaint town that lies just a few miles away, and from there branched forth into the surrounding country. What a change in transportation has taken place since that time. The motor yacht down below, in comparison with the sailing vessels that brought these pioneers over, is as many times superior as their craft were to the old dug-out canoes or rafts made of inflated skins.

Even eighty years has witnessed a revolution in things. The railroad trains rushing by the plant are a vivid reminder of changes that have taken place. The passenger cars of 1836 were built on the second floor of the shop and lowered to the ground and their primitive lines and small size stand out in startling contrast. Captain Whilldin's palatial passenger steamboat Sun would appear equally primitive today.

This plant, lying below, has witnessed all these changes. Even more, the initiative and energy of those who were responsible for its existence were an important factor in bringing about many of these changes. Viewed from this vantage point one could hardly help feeling a more intimate interest in the plant, an interest which is not in the least destroyed by getting back to the earth and to the practicalities of every day existence.

The Harlan Plant is fortunate in having a background of this kind. To those with imagination it is an additional inspiration to forward striving. And with this background it is doubly fortunate in having an organization that is not hampered by traditions of the past, but is looking forward to new and greater increasing activities in the future. When the Bethlehem Shipbuilding Corporation, Ltd., took this plant over, another step forward in the progress of the company was marked, because it meant greater stability and direct access to materials of construction within its own affiliations.

PIONEER RELICS EXCAVATED

Subterranean Landmarks Brought to Light

OVER a third of a century ago Peter Donahue and his brother, James Donahue, started a shop on the then waterfront, corner of First and Mission streets, where ships' boilers and machinery were repaired and general blacksmithing was done. Ships came up to the wharf on the east side of First street, in the little bay making into what was then called Happy Valley, and the Donahue main works were located on the west side of First street. The shop, which was called the Union Iron Works, was finally sold to H. J. Booth and Irving M. Scott, who was foreman but afterwards bought an interest of Booth. The works were gradually enlarged on the ground, still owned by Peter Donahue, and the large works recently located there and owned by Prescott, Scott & Company, were built. A few months ago the Union Iron Works were moved to their new quarters in South San Francisco, and Peter Donahue immediately tore down the old works he had founded, to make room for the construction of a large business block. Since the old Donahue shop was built the waterfront has traveled rapidly east and many squares of solid ground intervene between the old wharf and the site on which the new building is to stand.

The made land on the old site is now being excavated for basement and foundation room, and many curious reminders of the pioneer days of Happy Valley are being uncovered. The wharf piles, which for a quarter of a century have been buried under the floor of the Union Iron Works, have been uncovered for several feet, and are as solid and firm as iron. The piles are of sugar-pine, black with age and the action of water and from filings, in which they have been buried for years. When the wharf was built iron spikes were too expensive in San Francisco to be used, so the tops of the piles were mortised and the stringers fastened on the mortises by slots. The excavations show the spike-saving mortises in perfect shape and condition. These piles were covered with sand from a big sand dune on the opposite side of Mission street, and over this sand and mixed in with it was a great quantity of iron filings, slag from the old Donahue furnaces and quantities of small scrap iron. The mass had become almost solidified in the quarter of a century in which it had lain undisturbed, and the contractor who is excavating the ground and who thought he would have only to dig out soft, moist sand, has had to make a plentiful use of dynamite in the work.

Near the corner of Mission and First streets the excavation has uncovered a big sunken iron tank, fifteen feet or more in diameter, and the bottom has not been reached. The original use of this tank has bothered the interested loungers a great deal, and a Chronicle reporter yesterday hunted up Mervyn Donahue, who has immediate charge of the building, for an explanation. He said that in the early days of the old Donahue works his father had a contract to do some repairs on a ship lying where Fremont street now is, which included some new castings. The molds were made and the molten iron poured in, when an explosion occurred which literally raised the roof and damaged things generally. The explanation was that the tide water had seeped into the molds, and when the iron was poured in an explosion of course followed. His father was under contract to do the work, however, so he made a watertight tank, sunk it in the ground, filled it molding sand and made the castings successfully.

Near this tank, which will bother the contractor to remove, is another solid obstruction, being the lower part of the first trip hammer ever built in San Francisco. Two or three crane bases have also been uncovered and the tops of two pipes, which were successfully sunk for artesian water and forgotten for a quarter of a century, have also been exposed. The fact that such costly permanent improvements were swallowed up in the eastward progress of the city front is a forcible reminder of how the city grew with a rush in those days and a group of pioneers can always be seen watching with keen interest the excavations which remind them of the "good old days." (Chronicle, June, 1865.)

Pacific Marine Review

The National Magazine of Shipping

OCTOBER, 1924

Official Organ
PACIFIC AMERICAN
STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION
OF THE PACIFIC COAST

Pacific Marine Review Vol. 21 No. 10. Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. $2.00 a year.

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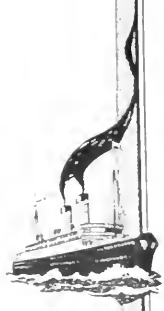
OCTOBER, 1924



OCTOBER, 1924 Vol. XX. No 10

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

339 AT 30 CHURCH STREET, NEW YORK

James S. Hines, President and Publisher.

Bernard N. De Rochie, Vice-Pres. and Manager.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1924, by J. S. Hines.
Published on the 25th of each month preceding the publication date.
Advertising and editorial forms close on the 20th.
Subscription price, a year: domestic, $2; foreign, $3; single copies, 25c.

Alexander J. Dickie Editor.

Paul Faulkner, Advertising Manager.

ALIEN SEAMEN

The Regulations recently issued by the Department of Labor create a Chinese Wall of Isolation against Alien Officers and Crews on all Foreign Vessels in American Ports and On American Vessels Returning From Foreign Ports

THE following is the full text of the regulations issued September 17, 1924, by the Department of Labor, Bureau of Immigration, relating to seamen under the Immigration Law approved May 26, 1924:

General Order No. 38. Subject: Alien Seamen.

1. Bona Fide Alien Seamen Defined.

A bona fide alien seaman within the meaning of subdivision 5 of Section 3 of the Immigration Act of 1924 is any alien whose sole occupation is to manage, navigate or operate, or assist in the management, navigation or operation of ships at sea, and includes any alien who is in good faith signed on the ship's articles and employed in any capacity on board any vessel arriving in the United States from any foreign port or place.

2. Foreign Ports.

Ports of the Panama Canal Zone shall be deemed to be foreign ports and any vessel entering and clearing from any such port shall be subject to all of the immigration laws, rules and regulations applicable to vessels arriving in the United States from any foreign port or place.

3.—Form 680.

Hereafter in preparing Form 680 the owner, agent, consignee or master of any vessel arriving in the United States from any foreign port or place shall insert before the name of each alien seaman who was not employed on such vessel on her last preceding voyage to the United States the word "First"; and the neglect, failure or refusal of the owner, agent, consignee or master of any such vessel to prepare said form in the manner herein required shall be deemed a violation of Section 36 of the Act of February 5, 1917, and punishable as therein provided for each alien seaman in respect of whom such violation occurs.

4. Admission of Alien Seamen.

(a) A bona fide alien seaman serving as such on a vessel arriving at a port of the United States and seeking to enter the United States as an immigrant shall be subject to all the immigration laws, rules and regulations applicable to immigrants and shall be required to present to the proper immigration official at the port of arrival an immigration visa duly issued and authenticated by an American consular officer in the manner required by law; provided that where it shall satisfactorily appear to such immigration official that such alien seaman has been previously lawfully admitted to the United States and is returning from a temporary visit abroad and is otherwise admissible he may be regularly admitted without an immigration visa upon payment of the requisite head tax.

(b) No alien seeking to enter the United States pursuant to the provisions of subdivision (5) of Section 3 of the Immigration Act of 1924 shall be permitted to enter unless he shall establish to the satisfaction of the proper immigration official at the port of arrival (1) that he is a bona fide seaman; (2) that his name appears on the duly visaed crew list of the vessel on which he arrives; (3) that he is an employe of such vessel and in good faith signed on her articles; (4) that he seeks to enter solely on business of such vessel, or that he seeks to enter solely in pursuit of his calling as a seaman; and (5) that he has no intention to abandon such calling; and where such immigration official is not so satisfied, he shall order the owner, charterer, agent, consignee or master of the vessel on which such alien arrives to detain such alien on board and deport him in the manner required by law.

5. Afflicted Seamen.

An alien afflicted with idiocy, imbecility, insanity, epilepsy, tuberculosis in any form, or a loathsome or dangerous contagious disease who is employed on board any vessel, including vessels of American registry, carrying passengers between a port of the United States and a port of a foreign country, shall, upon arrival in the United States, be detained and treated in a hospital under supervision of the proper immigration official at the expense of the vessel bringing such alien to the United States. In such case where the medical officer certified that such alien was so afflicted at the time he was shipped or engaged and taken on board such vessel and that the existence of such affliction might have been detected by means of a competent medical examination at such time, the immigration official in charge at the port of arrival shall serve or cause to be served on the owner, agent, consignee or master of such vessel a notice in writing that liability for the fine imposed by Section 35 of the Act of February 5, 1917, has been incurred in respect of each alien so certified.

6. Detention and Deportation.

(a) The owner, charterer, agent, consignee or master of any vessel arriving in the United States from any place outside thereof shall detain on board of

such vessel all alien seamen employed thereon pending the inspection and examination of such alien seaman by the proper immigration official, and, for the purposes of such inspection and examination, the owner, charterer, agent, consignee or master of such vessel may be required by such immigration official to muster all aliens employed thereon; and the failure, neglect or refusal of the owner, charterer, agent, consignee or master of such vessel to detain any such alien seaman on board until such seaman has been inspected and examined shall be deemed a violation of Section 20 (a) of the Immigration Act of 1924, and such immigration official shall forthwith serve or cause to be served on such owner, charterer, agent, consignee or master a notice in writing that fine will be imposed under said section for each alien seaman in respect of whom such violation occurs.

(b) Where for any cause the immigration official in charge at any port of arrival finds that an alien employed on board any vessel arriving in the United States from any place outside thereof should be detained on such vessel or deported, he shall forthwith serve or cause to be served on the owner, charterer, agent, consignee or master of such vessel a notice in writing to detain or deport such alien, and in such case an officer of the immigration service shall be detailed to verify the departure of such alien; and when such owner, charterer, agent, consignee or master fails, neglects or refuses to detain or deport such alien as required, such immigration official in charge shall forthwith serve or cause to be served on such owner, charterer, agent, consignee or master a notice in writing of the intention to impose the fine provided for by Section 20 (a) of the Immigration Act of 1924 for each alien in respect of whom such failure, neglect or refusal occurs.

(c) Where a bona fide alien seaman, serving as such on a vessel arriving at a port of the United States, and permitted to enter temporarily the United States solely in pursuit of his calling as a seaman, engages in any other calling or occupation for hire or profit, or enters into the coastwise trade of the United States, or remains within the United States for more than sixty days after such entry, he shall be deemed to have abandoned his status as a non-immigrant within the meaning of subdivision (5) of Section 3 of the Immigration Act of 1924, and shall be taken into custody and deported at any time thereafter in accordance with the provisions of Section 14 of said act.

7. Board of Special Inquiry.

Where an alien seaman is brought before a board of special inquiry for examination pursuant to the provisions of Section 34 of the Act of February 5, 1917, his qualifications for admission to the United States shall be determined according to the immigration laws, rules and regulations in force at the time of such examination.

SHIPOWNERS' ASSOCIATION ELECTS OFFICERS

The annual meeting of the Shipowners' Association of the Pacific Coast was held at San Francisco the last week of September for the purpose of electing officers for the ensuing year. All officers, with the exception of the vice-president were re-elected. A. B. Hammond, of the Hammond Lumber Company, who has served two years as vice-president of the association, retired. He was succeeded by L. C. Stewart of Sudden & Christenson. Mr. Hammond asked that his name not be submitted for re-election.

F. J. O'Connor was named for the second term as president and W. F. Sullivan continues as secretary-treasurer. The nine officers re-elected by the Shipowners' Association of the Pacific Coast were:

F. J. O'Connor, president;

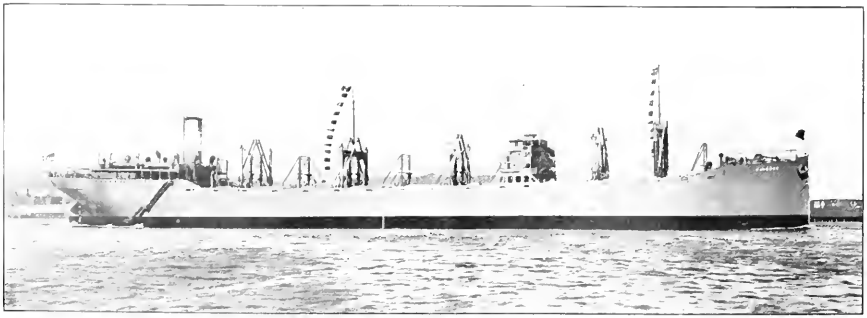
L. C. Stewart, vice-president;

W. F. Sullivan, secretary-treasurer.

Directors of the association include:

F. J. O'Connor, L. C. Stewart, A. B. Hammond, James Tyson of the Charles Nelson Company, S. D. Freeman of S. S. Freeman & Company, R. W. Myers of Hobbs, Wall & Company, Otis Johnson of the Union Lumber Company, S. M. Hauptman of Charles R. McCormick & Company; J. Fred Barg of the National Steamship Company.

The Shipowners' Association of the Pacific Coast is composed of representatives of practically all lines operating in the coastwise, intercoastal, and offshore trade of the Pacific Coast and have for their object the extension of the American merchant marine on the Pacific.



Steamship Cubore of the Ore Steamship Company

Pacific Marine Review

HANDICAPS AGAINST AMERICAN MERCHANT MARINE

An interesting table of comparison of manning and of wage cost compiled by the Transportation Division of the Department of Commerce from files of the United States Shipping Board are shown on this page. Particularly interesting at the present time in view of the high cost of ship operation are the difference between manning schedules and wages paid on foreign ships and similar cost items effective on United States Shipping Board and private American vessels. Wages are estimated to constitute about one-sixth of the total operating cost of a vessel. That American shipping is handicapped can be seen from the fact that wage scales range from 48.8 per cent to 215 per cent higher than wages paid on foreign ships.

In the table of wage costs reproduced on this page, an effort has been made by the Transportation Division to compare similar type steamships of 8800 deadweight tons operating in the same trade. The plan was carried out with the exception of the Japanese vessel, which, although of the same tonnage is engaged in a longer run and carries a larger crew than it would if operating in the same service as the others. It was thought advisable to omit the captain's salary, since among foreign shipping companies this is generally arranged between the shipowner and the captain.

Comparison of manning and of monthly wage costs[1] on an 8,800 dead-weight-ton coal-burning steamship of various maritime countries, as of July, 1924

Classification of employees	Great Britain[2]		Norway		Netherlands		Japan		Sweden		France		United States Shipping Board	
	Number of men	Wage cost	Number of men	Wage cost	Number of men	Wage cost	Number of men	Wage cost	Number of men	Wage cost	Number of men	Wage cost	Number of men	Wage cost
Deck department:														
Master	1	(3)	1	(3)	1	(3)	1	(3)	1	(3)	1	(3)	1	[illegible]
Doctor							1	$80.80						
First mate	1	$92.00	1	$61.86	1	$105.62	1	101.00					1	$[illegible]
Chief officer									1	$139.26				
Chief mate											1	$71.91		
Second mate	1	70.09	1	51.34	1	70.83	1	72.72			2	[illegible]	1	165.00
Second officer									1	70.14				
Third officer									1	55.09				
Third mate	1	60.38	1	36.81	1	60.52	1	50.50					1	140.00
Purser							1	44.44						
Clerk							1	23.02						
Carpenter and boatswain													1	[illegible]
Storekeeper							1	29.44						
Quartermasters							4	117.14						
Carpenter	1	60.58	1	26.65	1	42.87	1	[illegible]	1	60.12	1	27.75		
Bosts wain	1	46.00	1	26.98	1	42.87	1	44.44	1	46.50	1	24.[illegible]		
Able seamen	8	315.36	7	165.62	5	306.49			4	158.28			8	[illegible]
Sailors (various)							6	112.71						
Ordinary seamen	2	64.74	7	91.95			2	16.16	4	129.76	8	[illegible]	2	[illegible]
Radio operator	1	[4]65.71	1	[4]27.65	1	[4]105.00			1	56.71	1	[4][illegible]	1	[illegible]
First wireless operator							1	[illegible]						
Second wireless operator							1	50.00						
Deck hands					2	37.26								
Cadets							3	[illegible]			1	[illegible]		
Cabin boy					1	9.32					1	[illegible]		
Boys									2	34.28				
Engine department:														
Chief engineer	1	105.04			1	139.80	1	137.36	1	149.04	1	121.21	1	[illegible]
First assistant engineer							1	95.96					1	[illegible]
First engineer			1	77.64										
Second assistant engineer							1	72.72					1	165.00
Second engineer	1	92.00	1	60.60	1	85.[illegible]			1	72.64				
Third assistant engineer							1	50.50					1	140.00
Third engineer	1	70.09	1	46.05	1	67.10			1	[illegible]				
Fourth engineer	1	70.38	1	41.15					1	54.02				
Cadets							2	20.20						
Assistant engineers					2	93.29					3	[illegible]		
Oilers									3	125.04	3	72.[illegible]	3	217.50
First oiler							1	[illegible]						
Second oiler							1	24.[illegible]						
Third oiler							1	25.28						
Donkeymen	1	46.00	1	26.98	1	42.87								
Storekeeper							1	29.28						
Firemen	9	374.49	9	219.15	6	294.84	6	125.24	9	356.04	9	284.75	9	[illegible]
Firemen and oilers					1	42.87								
Apprentice firemen							2	1.[illegible]						
Trimmers	3	118.26			6	190.08			2	54.14				
Coal passers			3	41.79			7	12.[illegible]			3	[illegible]	3	18.00
Stewards department:														
Chief steward	1	59.14					1	28.71	1	84.12	1	91.00	1	150.00
Steward			1	46.05	1	27.96								
Storekeeper											1	18.[illegible]		
Chief cook									1	52.76	1	[illegible]	1	[illegible]
First cook							1	[illegible]			1	[illegible]		
Second cook							1	[illegible]	1	52.97	1	[illegible]		
Cook	1	64.76	1	36.90	1	18.[illegible]								[illegible]
Third cook							1	[illegible]						
Fourth cook														
Second cook and baker														[illegible]
Baker											1	[illegible]		
Assistant cook	1	32.85			1	11.18								
Cook boy			1	10.51										
Saloon waiter									1	[illegible]				
Messmen (various)							4	[illegible]	1	[illegible]				[illegible]
Mess boys			1	10.51	1	9.32								
Waiters											2	[illegible]		
Boys	2	37.04												
Total	39	1,782.71	42	1,104.14	38	1,623.03	61	1,[illegible]	40	1,830.[illegible]	47	[illegible]	41	[illegible]

[1] Conversions from foreign currencies made at the following rates: British pound sterling, $4.86, Norway krone, $0.1984, Dutch florin, $0.[illegible] Japanese [illegible] Swedish crown, $0.2638, French franc, $0.0632.
[2] As of June 15, 1924.
[3] Not known, generally by private arrangement.
[4] Wages estimated, operators employed by radio companies.

THE BIGGEST SHIP THROUGH THE BIG DITCH

By C. H. CALHOUN

THE biggest warship in the world, H. M. S. Hood of the British Navy, holds the record as the biggest ship of any class that has ever passed through the Panama Canal. The transit was made July last without a single mishap, the difficult job being all in the day's work with the efficient operating forces of the canal.

The Hood is 860 feet 7 inches in length with a maximum beam of 105 feet $2\frac{1}{2}$ inches, and her displacement tonnage at the time of transit was 44,799 tons, on which the tolls, at 50 cents per ton of displacement, amounted to $22,399.50, the largest amount paid so far for passage by a single ship. The great battle cruiser was drawing 32 feet of water when the transit was made, which was only five feet less than the minimum depth in the narrows of Gaillard Cut.

The passage of the Hood was the most "ticklish" job the canal operating force has had to tackle so far, the greatest chance for trouble being in the lockages and the passage of the Gaillard Cut. The marine superintendent, Captain A. W. Hinds, U. S. N., worked on the theory of the old maxim, "Better go slow than be sorry", yet the passage was made in about the usual time for the ordinary run of vessels. Seafaring men can appreciate the possibility for difficulty in handling this huge ship in the lock chambers where there was a clearance of only 2 feet $4\frac{3}{4}$ inches between the sides of the vessel and the concrete lock walls. The clearance at each end of the ship between the lock gates was 70 feet, as the locks are 1000 feet long.

H. B. M. S. Hood in Pedro Miguel Lock, Panama Canal

A feature that added to the difficulty in locking was the fact that the greatest beam of the ship was below the water line due to the fact that it was fitted with mine and torpedo blisters which are very sensitive and would not have withstood any considerable amount of pressure from the concrete lock walls. Outriggers were placed along the side of the ship to show the pilot the actual beam of the ship. Eight electric towing locomotives were used, four on each side, to hold the ship in the center of the lock and tow her from one chamber to the other. The passage of the three sets of locks at Miraflores, Pedro Miguel, and Gatun was made without a hitch. The lock walls were crowded with spectators who watched the operation and marveled at the fact that there was no shouting of orders or rushing about on the part of the men responsible for putting the ship through, everything working with clock-like precision.

There was some doubt as to how this huge ship with its unusual draft would handle in the narrows of Culebra (now Gaillard) Cut, where the canal width is only 300 feet and where there are eight turns varying from seven to thirty degrees. Some ships are hard to handle in the cut, especially when they are of heavy draft, and occasionally, when they are going on very nicely, they take a sudden sheer towards the bank. Then it is necessary to use all rudder and engine power and at times an anchor has to be dropped and the chain snubbed to stop the swing. As a matter of precaution a tug was placed ahead of the Hood on a short tow line to help swing the ship in case of trouble. However, the big ship behaved so nicely that the tug did not have to be used.

A thing that added somewhat to the anxiety of the operating force was the realization that any mishap or damage to this great warship of a friendly nation would cause unfavorable comment and give the canal a bad reputation, but they came through the ordeal with flying colors and received a message of hearty congratulations from the vice-admiral in charge of the Hood.

SEATTLE MISSION

Plans are now being perfected for the Second Seattle Commercial Commission to the Orient and invitations have been extended to business men and manufacturers of the Northwest. Captain J. S. Gibson will head the commission and official calls will be made in Yokohama, Kobe, Shanghai, Hongkong, and Manila. The delegation will sail from Seattle October 11, aboard the liner President Madison of the Admiral Oriental Line and will be gone about two and a half months.

THE CONQUEST OF THE FOG—II.

The United States Lighthouse Service Division of the Department of Commerce Works Out a Program of Radio Beacon Stations for the Protection of Shipping

"THERE is a hoarding up that tendeth to poverty, and a scattering abroad that maketh many rich."

The wise old writer of proverbs utters in these words a very fundamental maxim of business administration, and the taxpayers of the United States should indulge in some clear thinking along that line when they consider the slashing cuts in expenditures now being recommended to Congress by the director of the budget. We would particularly call the attention of the taxpayer and of Congress to the needs of the Department of Commerce and more particularly to the United States Lighthouse Service division of that department.

The Lighthouse Service is charged with the installation, operation, and maintenance of aids to navigation along all our coasts, Alaska, Hawaii, the Great Lakes, and rivers. This Service operates 60 tenders and 49 lightships, employs 5985 persons, and maintains 16,324 aids to navigation on an annual appropriation of $7,500,000 for these purposes. Mr. Taxpayer, if you put all of that into salaries, how would the average do for a living wage? Not much waste here surely!

The maintenance of aids to navigation along coast lines is one of the most necessary functions of modern government and one of the most urgent among international responsibilities. We should therefore be extremely conservative in practicing economy and most lavishly generous in encouragement toward efficiency and completeness in our Lighthouse Service. This Service has, for several years past, urged upon Congress the advisability of equipping our coasts completely with the radio beacon service.

The cost, as explained in an article in the September issue of Pacific Marine Review, is insignificant when compared with the benefits to be derived. The Lighthouse Service has worked out a preliminary installation plan, which, when put into effect, will give adequate radio beacon service to every part of the Atlantic, Gulf, and Pacific Coasts of the United States, Alaska and Hawaii. The layout of three proposed installations is shown on the map herewith, and the actual work is going forward as rapidly as funds available will permit.

When finished, these radio beacons will make safe navigation as readily practicable in the densest fog as it is now in the clearest sunshine, provided vessels are properly equipped to take full advantage of the wonderful service rendered by the beacons. The equipment necessary is some form of radio direction finder installed on the vessel.

To date the most practical navigating instrument for radio service is the Kolster radio compass. This instrument has demonstrated such accuracy and such simplicity of operation, over long service periods under very severe conditions, that it should be made a standard requirement for the equipment of American ships.

RADIO FOG SIGNAL STATIONS FOR THE COASTS OF THE UNITED STATES

SHIPOWNERS' LIABILITY FOR LIFE CLAIMS

An Interesting British Proposal to Settle This Vexed Question by An International Agreement to a Form of Life Insurance Covered in the Sale of Tickets

IN stating the existing rights of passengers and the liability of shipowners, Sir Norman Hill points out that in the intercourse of the world citizens of different nations travel on ships under many flags, and those ships on their voyages encounter other ships under many flags. The nature and extent of the responsibilities of the owner of the ship, by which the passengers are traveling, and of the owners of the ships met with, in respect of loss of life or personal injuries happening on the voyage, are therefore essentially questions that should be regulated by international law recognized and enforced by all states.

It is not sufficient to obtain international recognition of the legal principles: (a) that the laws of a nation are confined in their operation and effect to territorial limits over which the law maker has general and legitimate power; (b) that on the high seas a ship is part of the country to which she belongs; (c) that liability for a tort is governed by the lex loci delicti, as the general recognition of such principles would only perpetuate the present condition of doubt and uncertainty which surrounds the rights of the passengers and the liability of the shipowner.

All nations hold the shipowner responsible for loss of life or personal injury, either upon his own or upon other ships, resulting from his own personal defaults.

All nations hold the shipowner responsible for the negligence of the crew of his own ship, but some nations allow the shipowner and his passengers to limit or abrogate, by contract, this liability.

Switzerland alone places a liability on the shipowner in respect of accidents which have not resulted from negligence. The passage ticket issued to an emigrant must embody a general insurance for a small sum against all accidents, the shipowner at the same time receiving a small premium.

All nations place a limit on the liability of the shipowner arising from the defaults of his crew. Generally this limit is the value of the ship as it exists after the casualty, plus the earnings on the voyage on which the casualty occurs. If, therefore, the ship be totally lost there is practically no recovery. British law alone has fixed the limit at a sum calculated at a rate on the tonnage of the ship, which sum is payable whether the ship be lost or not. If outside territorial waters every ship were held by all nations to be subject to the laws of its own flag, there would still be no general law regulating the liabilities arising in consequence of a collision on the high seas between two vessels under different flags, or between the passengers of different nationalities and the owners of those ships, even if both vessels were under the same flag. In territorial waters there would be no uniformity in regard to the rights of passengers or the liabilities of the shipowners.

Speaking generally, the nations have so far contented themselves by enforcing their own laws, and the rights of passengers and the liability of the shipowner has varied materially in the courts of different countries.

Before the war efforts were made to secure the adoption of an International Convention relating to the limitation of the liability of owners of seagoing vessels, but it is open to question whether the proposals embodied in the draft convention, as revised by an international sub-committee which met in Brussels in March, 1913, would place the law of nations in regard to loss of life and personal injuries upon a satisfactory footing.

A sub-committee in Article VIII of the convention proposed that when death or personal injury is caused by the act or fault of the captain, crew, or any other person in the service of the vessel, the owner of the vessel is liable to the victim or his personal representatives to a maximum amount of £7 per ton of the vessel's tonnage, over and above the limit of liability provided for in the preceding articles.

If the victim or his legal personal representatives are not fully compensated by this amount they rank, as regards the balance of these claims, with the other claims against the amount specified in the preceding articles, regard being had to the priority of their lien.

The same limitation of liability applies to passengers on the carrying ship, but does not apply to the crew or other persons in the service of that ship whose right of action in the case of death or personal injuries remains governed by the law of the ship's flag.

The article, if it had been accepted, would have adopted the British practice. It would have secured that in every case in which there was legal liability there would be a sum more or less substantial, according to the size of the vessel in fault, out of which compensation would be payable. This would have been an advance in the interests of passengers upon the existing practice of the nations under which compensation recoverable is limited to the value, if any, of the ship in fault after the casualty. But it is open to doubt whether the article would give the relief which is in fact required.

As has been pointed out, the article imposes liability only in case where there has been negligence, and then only upon the shipowner whose servants have been guilty of such negligence. To establish liability the passenger would remain bound to prove in every case that there has been negligence on the part of the servants of the shipowner, but the suffering to the passengers and the loss to dependents are

MARINE LIFE INSURANCE

Sir Norman Hill, vice-president of the Chamber of Shipping of the United Kingdom, has recently submitted for the consideration of shipowners and passengers a plan whereby a form of insurance can be substituted for the liability of the shipowner in case of disaster.

This proposed insurance plan for the protection of passengers on ships and their dependents comes at a time when the subject is receiving increasing attention among maritime nations, a circumstance that has led the Marine Bureau of the Chamber of Commerce of the United States to prepare an abstract of this plan which forms the basis of this article.

the same, whether the personal injuries or loss of life have resulted from negligence or from the perils of the sea. The loss to dependents is the same whether negligence can be proved by survivors or, owing to the disappearance of a ship with all hands, there is no evidence upon which a claim can be based.

As illustrative of the manner in which the article, if adopted, would have worked, Sir Norman Hill refers to several recent casualties.

In 1909 two British passenger vessels carrying 175 passengers were lost. Both vessels had put to sea, well found and seaworthy in every respect. As there was no evidence to show what had caused the loss no claims could be substantiated. No compensation was payable to the dependents of the passengers under the existing law, and none would have been payable under the convention if Article VIII had been adopted.

In the case of the Titantic the English courts held that the speed of the ship should have been reduced in the vicinity of ice, and that the shipowners were responsible for the captain's action in following what was then the established practice of proceeding at full speed. Of the 825 lives lost, some left no dependents, others left families who were not dependent upon them, many were emigrants whose wages had been low and who had no settled occupation. On the other hand, many who were earning good incomes left those who were entirely dependent upon them.

The total payment of the shipowners was £171,660 or at the rate of a little over £200 in respect of each of the 825 lives lost.

If all the claims had been brought in the United States courts and the shipowners had insisted on their legal rights, the total amount payable would have been £20,000, or at the rate of about £24 for each of the 825 lives.

If the Titantic had been owned in the United States, France, Germany, or any country other than England, the limit of the shipowners liability would have been the £20,000.

Under the convention, with the limit of liability of £260,000, which would have included liability to the dependents of the crew, the maximum amount recoverable would have been at the rate of about £250 in respect of each life lost.

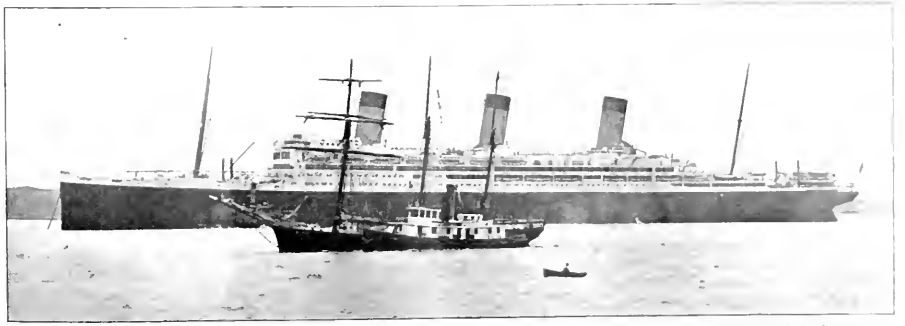
If the Titantic had gone down with all hands no claim could have been substantiated in either the English or United States courts under the existing law or the convention, as there would have been no witnesses to prove how the disaster occurred. As it was, the difficulty and cost of substantiating the charge of negligence was serious.

The costs of substantiating claims was out of proportion to the amount of compensation recovered, and there is nothing in the convention which would obviate this waste of money.

The Empress of Ireland and the lives of 840 passengers were lost through collision with the Norwegian steamship Storstad, for which collision the latter was held solely to blame. The Storstad was arrested in an action in the Canadian courts and sold for £36,-000. The limit of liability of the owners in the English courts under the existing law would have been £67,500. In the Canadian courts the limit of liability was £48,000, but the courts had no jurisdiction beyond the £36,000 realized on the sale of the vessel. In the Norwegian courts the limit of liability was the £36,-000 realized on the sale of the vessel. Under the convention the limit of liability would have been £24,500, or £7 per ton, plus £36,000 realized on the sale; in all £60,500. The Storstad being held alone to blame, the owners of the Empress of Ireland, the owners of the cargo on that vessel, and the passengers were entitled to a claim against the fund of £36,000. If it be assumed that the passenger life claims were assessed at the rate that prevailed in the Titantic case, namely £200, then the claims as against the £36,000 would have been as follows: 840 passenger life claims at £200 a claim, £168,000; compensation to the dependents of the crew of the Empress of Ireland, £28,000; value of the Empress of Ireland with cargo on board, £500,000, or a total of £696,000.

In the case of the Falaba the lives of 57 passengers, and in the case of the Lusitania the lives of 791 passengers were lost. Both these vessels were sunk by war vessels for whose acts the shipowners were not responsible; therefore no compensation was recoverable, and none would have been recoverable under the convention.

The facts of these casualties prove that under the existing law and under the convention, if it be adopted, the amount recoverable by the dependents of a passenger whose life is lost in sea casualty is nothing more than a gamble. It depends on (1) the possibility of proving negligence, and in the case of a missing ship this is nearly always impossible; (2) on nationality of the ship on which there is negligence; (3) on the size of the ship upon which there is neg-



An unusual snapshot from New York harbor showing in order a rowboat, a revenue cutter, the British barkentine Alcantic, and the International Mercantile Marine steamship [illegible]

ligence; (4) on the value after the casualty of the ship on which there is negligence; (5) on the total number of lives lost in the casualty. Even if the limit of liability were materially increased above the £7 per ton, the gamble would be there, only the stakes would be higher.

Neither the passengers nor the shipowner want to engage in such a gamble.

What the passengers want is insurance against the consequences of accident, and this insurance must be for fixed sums and payable on the happening of death. It must not be an insurance against negligence alone. If a life is lost at sea in any casualty, however caused, the insurance money must be immediately payable.

The insurance must be payable in full under all circumstances. The dependents of the passengers do not want to gamble on the chance of recovering £10 if the Storstad is to blame, or £75 if the Empress of Ireland is to blame, or to be told that if the passenger had traveled by the Titanic the compensation would have been £200 instead of £10.

Further, the insurance should cover not only loss of life, but also personal injuries sustained in casualties during the voyage. Many passengers are unaccustomed to the sea and accidents happen for which no one is to blame.

If such an insurance scheme were established it would of necessity have to be worked between the shipowner and the passengers carried on his ships. It would not be possible to make a vessel encountered upon the voyage which caused or contributed to the casualty directly liable to the insured passengers under the scheme. Further, any such scheme must be established on a fair basis as between the shipowner and the passenger, and as between the different classes of passengers, so as not to increase unnecessarily the cost of the carriage of all passengers or of the general oversea trade of the world.

It would be necessary if the scheme is to cover all risks that the protection afforded should be accepted by the passengers in full satisfaction of all claims founded on the negligence of the shipowner's servants. To add a liability under the scheme to a liability for an unascertained amount in respect of claims resulting from such negligence would be inequitable to the shipowner and would unnecessarily increase the cost of carriage.

It may be argued that the establishment of such a scheme would weaken the shipowner's responsibility and discourage him in his efforts to secure safety. But the scheme would not relieve the shipowner from full responsibility when the casualty was caused by his personal default, and the shipowner now insures himself against all liability resulting from the negligence of his crew. There would therefore be no weakening in the feeling of responsibility, but the insurance which the shipowner now effects would become a real security for the passengers and not merely an indemnity to the shipowner against such claims as can be substantiated against him at law.

It is a difficult matter to determine the amounts that should be covered by an insurance scheme, but they should be uniform for all passengers of whatever class. The amount should be fixed with regard to the emigrant class because they are perhaps less able than any other to protect themselves, and because it is that class who would feel most acutely any advance in the cost of carriage, for it must be borne in mind that the cost of the scheme would form part of the working cost of the service rendered by the shipowner, and will have to be covered, perhaps entirely, by the rates to be charged, in the same way as the existing uncertain liability of the shipowner now forms part of the cost of service, and has to be covered by the rates now charged.

Probably the average emigrant sailing from the United Kingdom would not insure against accidents in a sum in excess of £150. In fact, a very few of that class do insure themselves for so large a sum. The emigrants from the continent of Europe could not afford so high an insurance. In Switzerland insurance under passenger ticket is only 500 francs. Further, there are many emigrants without dependents who would object to contributing to the cost of any insurance scheme. In these circumstances it is suggested that the compulsory insurance should be established on the following scale:

In the case of death for adults over 18, £150; adults between 12 and 18, £50; children under 12, £10. In the case of permanent disablement, destroying earning power to the extent of 50 per cent: adults over 18, £150; adults between 12 and 18, £100; chilren under 12, £50. In the case of permanent disablement, destroying earning power to the extent of less than 50 per cent: £75 for adults over 18; £50 for adults between 12 and 18; and £25 for children under 12. In the case of disablement temporarily affecting the earning power: 20s. a week for a limit of 12 weeks for adults over 18; 10s. a week for same limitation of time for adults between 12 and 18; and 10s. a week with the same limitation of time for children under 12.

It is recognized that the compulsory scale must be a minimum one, and to meet the requirements of passengers desiring greater insurance it is suggested that under the scheme the shipowner should on demand be bound to grant such extra insurance up to any reasonable amount, at a fixed rate of premium. Thus all insurance will be available for the passengers who require it, but without extra indirect cost being placed on those who do not require it.

It would be possible to cover under such an insurance scheme troops of any belligerent power carried in war times. And, besides, special arrangements would have to be made in regard to the carriage of Asiatic and African pilgrims and coolies, as passengers of these classes could not bear either directly or indirectly the cost of an insurance on a scale applicable to Europeans.

The question remains as to the manner in which any such insurance scheme could be worked into the convention. It is suggested that the rights of the passengers on the carrying ships should be governed by the insurance scheme which should, if possible, be adopted internationally. If it is not possible to obtain international agreement, then those rights should, as in the case of the crew, be governed by the law of the ship's flag, leaving each nation free to adopt, if it pleases, the scheme.

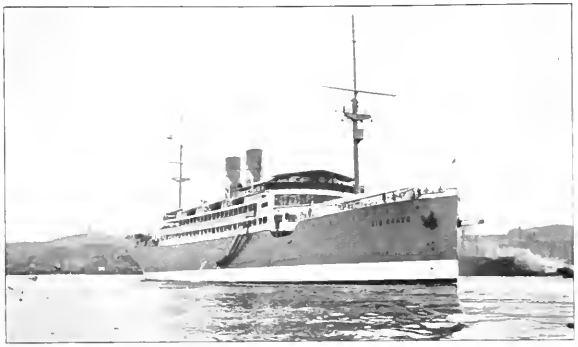
The liabilities of the ship other than the carrying ship, should be left as in the draft convention, but under the insurance scheme the shipowner who has paid compensation to the passengers or their representatives should be entitled to claim repayment from the ship in fault up to the lmit of that ship's liability.

NEW TYPES OF MOTORSHIP AND DIESEL MACHINERY

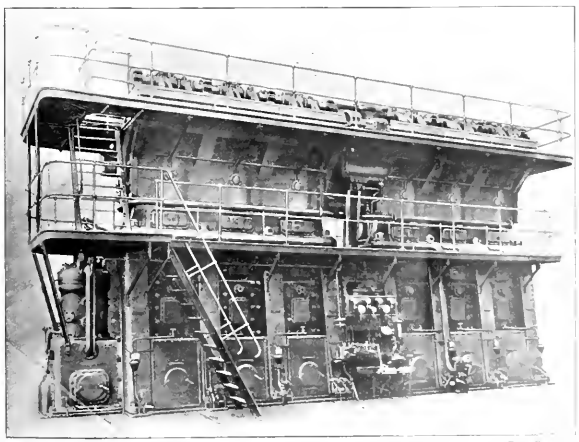
Special European Correspondence

SOME British shipowners have recently been complaining that there are so many types of diesel engine that it is difficult for them to make a choice, and that it would be better if there were more standardization. There is no likelihood of such a development in the near future, for new designs continue to make their appearance. Not only so, but novel types of motorship are being built, conforming to requirements which would be incapable of fulfillment with steam propulsion.

An excellent example is to be seen in the cargo and passenger vessel Rio Bravo, which sailed from Hamburg on her maiden voyage at the end of August for Mexican ports, with a call at Southampton. It was desired that this ship, which is of 6000 tons gross and carries about 4500 tons of cargo, in addition to ninety passengers, should make a non-stop run between Southampton and Vera Cruz in seventeen days, with an average speed of thirteen knots. With a steamer burning, say, fifty tons of coal daily, the proposition would have been extremely difficult; but the motorship, with a consumption of about twelve tons daily, can easily carry sufficient oil in double bottoms for a round trip. At Vera Cruz, oil costs between $10 and $12 a ton, and good coal such as is required for a passenger ship is not much cheaper. Hence, the motor vessel burning only one-quarter as much oil as coal required on the steamer shows to remarkable advantage.



New cargo and passenger motorship Rio Bravo.



One of the Krupp 4-cycle direct reversing marine type diesels as installed on the Rio Bravo.

The two Krupp engines installed in the Rio Bravo are of a new type. They operate on the four-cycle single-acting principle and develop 1400 b. h. p. at 125 r. p . m, the six cylinders having a bore of 650 m.m. and a stroke of 1000 m.m. The construction is somewhat remarkable. The main framing consists of cast iron columns, and there are two complete castings, each comprising three cylinders, flanged at the bottom and bolted direct on to the frames. As is well known in most engines, each cylinder is cast separately.

The reversing mechanism, which is operated through a wheel controlled servo-motor, lifts the valve levers off their cams, moves the camshaft fore and aft, and then replaces the valve levers on the cams. This is a normal construction. Krupps have, however, produced a patented method of starting, carried out by the two small handlevers at the control station in the illustration, by means of which starting air and fuel are introduced into the cylinders practically simultaneously. The claim made for this

arrangement is that the amount of starting air used is relatively small, while owing to the additional impulse on the piston the engines start up very rapidly.

As in so many of the recent European motorships, arrangements are made for the utilization of boiler oil, although the installation for this purpose seems somewhat cumbersome. It includes a big tank in which the oil is heated to about 80 or 90 degrees Centigrade and a number of filters and separators, which occupy quite a large space in the ship.

A fine electric equipment is provided, as there are three diesel-driven dynamos, each of 100 k. w.

With her two funnels the Rio Bravo has a striking appearance, and needless to say these are not required from the machinery point of view, as one would have sufficed.

Geared Diesels for Liners

Another remarkable and novel class of motorship machinery is that which has been built by Blohm & Voss, at the well known Hamburg yard, for installation in the 14,000-ton motor passenger liner Monte Sarmiento, which was launched recently and will be placed in commission in November by the Hamburg South America Line on the South American run. She will thus be the first of the numerous big motor liners to be put into operation, and a sister ship is being constructed for the same service.

In order to diminish the cost and weight and at the same time to reduce the space occupied by the machinery, the owners and builders decided to adopt fast running engines, driving the propellers at moderate speeds. There are four 6-cylinder motors of the 4-cycle M. A. N. type running at 217 r. p. m. and each developing 1750 b. h. p., so that the total power is 7000 b. h. p., which it is hoped will give the vessel a speed of between 15 and 16 knots.

The engines are arranged to drive the propeller shaft through single reduction gearing so that the propellers turn at only 77 r. p. m. The driving pinions on each pair of engines gear into one wheel so that there are only two propeller shafts. A special system has been employed to give the necessary flexibility to the drive, as otherwise it might be anticipated that some troubles would be experienced through the shocks from the engine being transmitted to the gearing.

Lately a good deal of attention has been paid by European designers to the possibility of increasing engine power by supercharging the air admitted to the working cylinders. This plan is being adopted on the Monte Sarmiento and electrically driven turbo-blowers supply air at a pressure of 3 or 4 pounds per square inch, which is delivered to the cylinders through the inlet valves instead of air being drawn in direct from the engine room in the ordinary manner. The only disadvantage is that the mean effective pressures in the cylinders are increased and this may possibly have an influence upon the reliability of the machinery.

Yacht's Diesel Engines

Another new class of European engine is to be found in the type which has been installed in the motor yacht Vedette, owned by F. W. Vanderbilt, which recently crossed the Atlantic after completion at Burmeister & Wain's yard. This yacht is a vessel of 158 feet 6 inches overall, with a displacement of 640 tons, and a trial trip speed of 17 miles per hour was attained.

The machinery power is 1400 i. h. p. and there are two Burmeister & Wain engines installed which run at the unusually high speed of 300 r. p. m. The object of adopting such high speed motors is, of course, to reduce weight, and they are of the trunk piston design, which curiously enough is finding favor among some owners of twin-screw cargo ships because it is cheap and light. Needless to say, however, in such vessels a speed of 300 r. p. m. is not reached, 150 to 160 r. p. m. being more common. The engines have been specially designed with a view to the elimination of vibration, and have cylinders carried on the top of the box-shaped crankcase with the cylinder cover supported quite independently by steel bolts extending down to the bedplate.

In this yacht, the method that has lately found favor among European shipowners by which the large auxiliary maneuvering compressors can be eliminated is employed. Each of the two 50 horsepower generating sets is provided with an air compressor of larger size than is required for the supply of injection air, and when the vessel is approaching port or is about to leave, these compressors discharge a surplus quantity of compressed air for starting and maneuvering purposes.

New Busch-Sulzer Catalog

WE have just received the new diesel engine catalog compiled by the Busch-Sulzer Brothers Diesel Engine Company of St. Louis. This catalog is a comprehensive study of diesel engineering for prospective purchasers.

The twenty-six years of American diesel experience enjoyed by the Busch-Sulzer Brothers Diesel Engine Company has made it possible to collect actual operating data of the most authentic nature. This collection of data is concisely given in table form in the new catalog and is instructively illustrated with curves and charts.

Prospective purchasers of prime mover equipment will find a wealth of information here, which will be of material value in determining and appreciating the economy effected by the diesel installation.

Operating engineers will find the catalog of great assistance to them in comprehending the 2-cycle principle, and it will prove interesting to them to compare the results obtained by their equipment with the efficiency accomplished by the Busch-Sulzer engine.

Engineers will find valuable data on installation layouts and costs, which will materially assist them in planning diesel engine installations. A number of highly interesting engine illustrations have been incorporated in the catalog, showing diesel engines constructed by the Busch-Sulzer Brothers Diesel Engine Company and engines built by Sulzer-Freres of Winterthur, Switzerland.

Sulzer-Freres have a partnership affiliation with the St. Louis concern, through which combination the experience of the Swiss company and the original American Diesel Engine Company has made possible the building of very large marine diesel engines.

The conversion to a motorship of the steamship Bintang represents the largest marine installation of its kind yet accomplished.

The largest motorship afloat, namely the Aorangi, is equipped with 13,000 shaft horsepower Sulzer diesel engines. This vessel will shortly visit the Pacific Coast en route to New Zealand.

Busch-Sulzer Brothers Diesel Engine Company is represented on the Pacific Coast by A. A. Tacchella with offices in the Rialto Building, San Francisco. Mr. Tacchella was the erection engineer for Sulzer Brothers during the installation of the first direct reversible marine diesel engine ever made.

Pacific Marine Review

THE SLIDING CYLINDER DIESEL

WE have recently received from Europe comments on the maiden voyage of the motorship Swanley, owned and operated by Harris & Dixon, Ltd.

This vessel is of peculiar interest because she is the first vessel to be powered with the new 2-cycle, double acting, diesel engine designed and built by the North British Diesel Engine Works, Ltd., of Whiteinch, Glasgow.

The voyage was from Cardiff to Colombo with a full cargo of coal. With the exception of a stop at Port Said on passage through the Suez Canal, the entire trip was nonstop for the engines. From Cardiff to Port Said the speed of the Swanley was just under 10 knots, with an oil consumption of 6 tons per day for the main engines and with the engines running at an average of 83.5 revolutions a minute. Between Suez and Colombo the average speed was 10 knots on a fuel consumption of $6^1/_4$ tons of oil for the main engines. The conditions of this maiden voyage were very severe on new engines, a great deal of maneuvering being necessary both in the passage of the Suez Canal and in the entrance to Colombo, in addition to which great heat was experienced in Suez, the sea water temperature there during the passage being 92 degrees. In the Arabian Sea severe gales were encountered and dangerous seas running. Through all this the engine functioned perfectly.

This engine was developed largely through the work of J. C. Maclagan, the chief engineer of the North British Diesel Engine Works, and the following description and illustrations are taken from a paper read by Mr. Maclagan in April, 1924, before the Institute of Engineers and Shipbuilders in Scotland.

It will be noted that there are two factors in the design of this engine which are calculated to overcome the difficulties in practical working of double action in the diesel cycle; first, the piston rod is dispensed with; second, the cylinders are free to expand under heat stresses and are reciprocated by an ingenious link motion so as to give the most efficient port scavenging system that has ever been incorporated in a diesel engine design. The engine as installed on the motorship Swanley is of the directly reversible marine type, with three cylinder units each $24^1/_2$ inches bore by 44 inches stroke and designed to give 2000 brake horsepower at 100 revolutions a minute.

The liners are independent of the cylinder jackets, in which they are a light press fit. The jackets are ordinary cast iron and the liners of special high tensile strength cast iron. For the greater part of its length and over the entire combustion space, the liner is a plain tube without any irregularities and is surrounded by an uninterrupted jacket of water. The liner is not pierced in any way to accommodate valves and is entirely free to expand in any direction. The two rows of ports for scavenge air and exhaust are perfectly symmetrical. A comparison of this type of cylinder and construction to the ordinary single acting engine cylinder is shown in one of the illustrations. The ports for the introduction of clean fresh air for scavenging and for combustion are at the opposite end of the liner from the exhaust ports, thus eliminating as far as possible the violent stresses set up by continual alternating expansion and contraction of the same fibers in the metal.

Cylinder Covers

The cylinder covers are a very simple casting made tight by rings bearing on the inside of the sliding cylinder. They are interchangeable top and bottom and lend themselves to the use of special metal without excessive cost. The cover is free to expand in any direction and is fastened to the entablature by four $1^1/_2$ inch studs, the stress in which is practically nil. The cover is pierced only by one hole for the fuel valve. The starting air is introduced through an annular space around the head of the fuel valve. It will be noted in the construction that any leakage of gas past the rings of the cylinder covers will be trapped in the scavenging belt.

The Piston

The main piston is made in three parts, a central body covering the guide shoe at the center of its length and two heads or caps of special cast iron which take the piston rings and form the working heads exposed to heat of piston. Piston cooling water is applied through a facing at the center of the length of the piston structure and through a system of telescopic pipes, the entire system being outside of the cylinders. A gudgen pin through the center of the piston body carries the upper ends of the forked connecting rod, so that in this engine, without excessive height, there is combined the advantages of crosshead guide, trunk, piston guide, and a comparatively high ratio of connecting rod to crank, which in the case of the Swanley's engines is 8 to 1.

Advantages

The principal advantages associated with the sliding cylinder design are summarized as follows: First, end to end scavenging; second, simplification of parts subjected to heat; third, free expansion of cylinder cover and cylinder liner; fourth, improvement of accessibility of internal parts; fifth, the rubbing speed of the piston is reduced nearly 30 per cent.

It has been shown in action in the motorship Swanley installation that this new principle gives a double acting 2-cycle engine developing 660 brake horsepower per crank with lower bearing pressures, lower stresses in moving parts, lower cylinder diameters, and lower rubbing speeds than obtain in the ordinary 4-cycle, single acting engine of 220 brake horsepower per crank, the revolutions being the same in both cases. The builders are satisfied from their experience that they can produce these engines at a cost which will be low compared with that of either 4 or 2-cycle, single acting engines of the same power.

Fuel Consumption

At full load with boiler fuel the best consumption record over extended tests is .448 to .45 pounds per brake horsepower hour using boiler fuel. With experience it should be possible to improve on that figure. The table reproduced herewith gives various particulars of pressure and temperature readings taken on an eight-hour shop test. The parts of the sliding cylinder type of engine subjected to heat are exceptionally free to expand and on account of the efficient cooling the temperature in these parts is comparatively low. Fresh water is used for circulating the main cylinders and pistons. The mechanical efficiency of the engine will figure around 76 per cent.

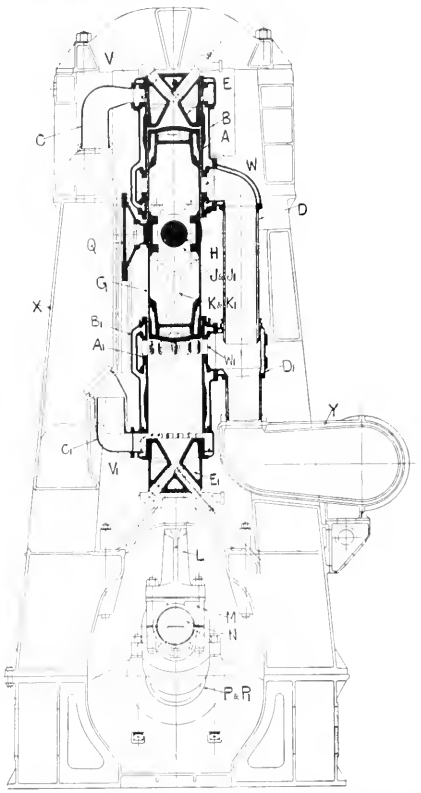
Large Powers Possible

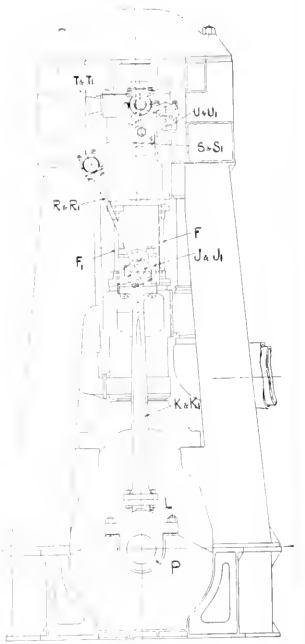
Carefully prepared machinery layouts for a twin screw vessel with 12,000 horsepower the equivalent of steam indicated show two engines with 8 cylinder units each of the same diameter and stroke as those

of the engine on the Swanley and giving a trial indicated horsepower of 13,200 at 96 revolutions a minute, the engine being self-contained so far as scavenging pumps and air compressors are concerned.

This layout shows a saving in space, compared with a coal burning steam plant, of over 40 per cent, the machinery weight for the diesel installation being 1800 tons and for the steam installation 2380, the oil engine using 52 tons of fuel oil per day as against 190 tons of coal for the steamer. The total weight of machinery and fuel for the 20 day passage would then be 2840 tons for the diesel installation and 6180 tons for the steam installation.

With cylinders 28½ inches bore by 54 inches stroke, each cylinder develops 1000 brake horsepower at 90 revolutions a minute with a mean indicated pressure of about 88 pounds per square inch per minute. It will be noted that these characteristics are well within conservative diesel engine practice and need give the builders no anxiety. It is easily possible, then, with two 8-cylinder, double acting diesels to guarantee the equivalent of 18,000 indicated horsepower steam engines on these performances, and Mr. Maclagan figures that the total weight of machinery for such an installation would be 2900 tons and the fuel consumption would be 77 tons per day at sea.





LEGEND

The parts as lettered on the two elevations of the North British double acting sliding cylinder diesel engine shown on this page are as follows: A and A1, cylinders; B and B1, water jackets; C and C1, scavenging branches; D and D1, exhaust branches; E and E1, cylinder covers; F and F1, cylinder ties; G, double ended piston; H, gudgeon pin; J and J1, upper connecting rod bearings; K and K1, connecting rods; L, connecting rod fork; M, crank pin bearing; N, crank; P and P1, crankshaft bearing; Q, piston guide; R and R1, cylinder reciprocating rod; S and S1, cylinder reciprocating levers; T and T1, cylinder reciprocating links; U and U1, fulcrum bearings; V and V1, scavenging ports, W and W1, exhaust ports; X, front column used as scavenging air reservoir; Y, exhaust manifold.

	PRESSURES IN LBS/□"							TEMPERATURES IN DEGS FAHR																												
									AIR COMPRESSOR																											
TIME	BLAST AIR	H.P. DISCH AIR	L.P. DISCH AIR	SCAVENGE AIR	CYL. JACKET WATER	PISTON COOL'G WATER	FORCED LUBRICATION	ATMOSPHERE	DISCH L.P. CYLR	FROM "	TO H.P.	FROM "	TO H.P.	FROM	COOLER WATER TO	L.P. WATER FROM	WATER FROM EXHAUST MANIFOLD	INLET WATER TO CYL. JACKETS	OUTLET FROM No. 1 CYLR	" 2	" 3	INLET TO PISTONS	INLET TO No. 1 PISTON	" 2	" 3	OUTLET FROM No. 1 PISTON	" 2	" 3	INLET TO F.W. COOLER	OUTLET FROM "	F.W. TO COOLER	F.W. FROM COOLER	SCAVENGE AIR	No. 1 EXHAUST	No. 2 EXHAUST	No. 3 EXHAUST
1.35 pm	1000	100	11	1⅝	17	17	3½	50°	252	110	274	132	[illegible]	[illegible]	93	124	112	98	128	127	128	97	110	108	109	124	126	122	37	80	116	100	94	[illegible]	454	488
1.15	1000	100	11	1¾	18½	18	3	49	243	103	271	127	474	134	95	99	108	95	126	124	124	94	106	105	105	126	128	126	38	76	116	92	94	508	430	510
2.15	1050	100	11	1¾	18	17	2½	49	245	105	276	131	460	134	95	100	114	93	128	132	130	92	106	106	105	127	127	130	37	78	121	97	95	470	485	570
3.15	1050	100	11	1¾	18	17	2¼	49	[illegible]	104	281	129	482	137	98	100	115	98	134	130	134	97	113	114	113	131	130	129	37	78	122	95	[illegible]	508	516	546
4.15	1050	100	12	1¾	19	20	2¾	49	262	105	284	132	478	134	97	101	113	97	132	130	129	96	106	108	109	130	132	130	37	77	120	99	97	480	470	505
5.15	1050	100	12	[illegible]	[illegible]	18	3	49	260	97	278	135	[illegible]	134	92	99	114	92	134	132	130	91	103	103	104	128	126	128	37	76	116	94	96	480	492	536
6.15	1050	100	12	1⅝	[illegible]	[illegible]	3	48	[illegible]	99	280	[illegible]	[illegible]	130	91	95	110	91	128	130	126	90	103	102	104	128	130	130	36	75	118	90	97	516	534	[illegible]
7.15	1050	100	12	1¾	[illegible]	[illegible]	3	47	252	100	276	130	[illegible]	132	92	[illegible]	112	92	124	126	124	91	104	104	103	124	122	124	36	75	119	93	94	472	476	504
8.15	1050	100	12	1⅝	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	98	278	116	[illegible]	123	84	95	106	84	126	126	128	83	98	98	97	120	124	125	36	71	121	89	96	465	464	485
9.15	1050	100	12	1⅝	16	15	[illegible]	[illegible]	252	96	270	119	440	125	83	90	98	83	118	116	120	82	93	94	93	116	118	115	37	64	109	80	95	[illegible]	434	[illegible]
11.15	1050	110	13	1⅝	15	15	2½	[illegible]	[illegible]	94	262	119	465	121	82	88	104	82	116	120	117	81	95	93	93	118	114	116	37	63	112	82	95	465	470	480
1.15 am	1050	110	13	1¾	15	16	2½	48	[illegible]	98	278	122	470	127	88	95	106	88	126	136	124	87	94	92	94	124	122	124	37	67	116	84	93	452	457	470
2.15	1050	100	12	1¾	16	16	3	48	[illegible]	[illegible]	270	116	[illegible]	125	87	99	108	87	124	126	126	86	103	103	102	130	130	128	37	74	118	90	95	478	498	508
3.15	1000	100	12	1¾	15	15	3	48	260	104	[illegible]	127	470	124	94	104	110	94	128	130	129	93	101	102	101	134	130	132	37	70	116	88	96	485	494	480
4.15	1025	100	12	1¾	15	18	3	48	255	104	265	128	470	126	97	103	112	97	130	132	132	96	102	102	101	138	135	136	37	71	116	86	94	480	485	475

Table of pressures and temperatures on a full load shop test of the North British double-acting sliding cylinder engine.

PACIFIC WORKBOATS AND THEIR POWER PLANTS

THE PACIFIC WORKBOAT

In this new section of Pacific Marine Review we are undertaking to tell the story of the development of the workboat on the Pacific Coast. For this purpose we have retained the services of a practical marine engineer of long experience who will tell the story from the point of view of the operator. We believe that the Pacific Coast leads the United States in the development of the workboat power plant and in the application of that plant to practical operating conditions afloat, and we are sure that our readers will find much of interest in a department devoted to this subject.

THE average shipping man is probably unfamiliar with the magnitude of the business done by workboats. In less than forty years these useful and sturdy craft have grown from one to nearly one thousand. This is only around San Francisco Bay and the tributaries thereto.

In 1887, Captain Charles McNeil of Tiburon built and operated for business purposes the first internal combustion engined craft on these waters. Captain Joseph Kane of San Francisco built the next one. In 1888 Captain Henry C. Peterson decided that a gasoline powered craft was preferable in a business sense to the steam or wind propelled small vessels of that day and began building a fleet of modern power boats.

Before this time, there were a number of small steam lighters and tugs. However, the operation of these was expensive and the original cost high. A few of them had condensing engines; most of them were non-condensing high pressure. Towage of small sailing vessels across the Bay, docking of same, and acting as tenders to the then considerable fleet of deep water ships was the principal work of these steam workboats. At times, fishing and picnic parties were carried, but the limitations of usefulness for this work were obvious, as these small steamers were soft coal burners and as a rule very dirty and black.

The engine of Captain Peterson's first boat was single cylinder, built in 1888 by the Union Gas Engine Company of Oakland, California. A Mr. J. Regan was the inventor of the type then used. Its single cylinder was horizontal with two large heavy fly wheels. A friction clutch provided for ahead and astern motion by a suitable arrangement of bevel and spur gears. That they were noisy and full of shakes is easily understood. They were set high in the hull and were, for their power, exceedingly heavy.

Los Angeles Harbor tug powered with a Fairbanks-Morse CO engine

Early Objections

To show the advance of workboats in the minds of the general public, one of the old time operators told a Pacific Marine Review writer the other day a queer story.

"When the first gas boats began to do business," he said, "many people were afraid to ride in them, as the idea had gained headway that the gas boats were very dangerous. All sorts of stories of awful calamities were circulated—how the fuel was liable to explode or get on fire, that the fumes from the gas were very hurtful to health, etc. Much of this talk was fostered by those whose business was being hurt by the new style of hardy harbor workers. But like all ancient superstitions, time has proved their fallacy."

If we remember rightly, the advent of the automobile was met by much the same objection. Both it and the workboat are now tremendous factors in business and pleasure.

The new twin screw power boat Solano sliding off the ways at the Anderson & Siemer yard, San Francisco. Note the flat bottom.

Those early engines marked a stage in the development of workboat power plants but were, of course, almost immediately superseded by improved types. Soon came the vertical cylinder type of engine with planetary reverse gears. The old style "make and break" ignition system, where the break was made by the action of springs, was improved upon. This was followed by "jump spark" ignition with a primary mechanically controlled, followed in due time by the high-tension magneto system.

Development of Workboat Design

At first it was customary to build these boats about five beams in length, a 50-foot hull having a 10-

foot beam. The section through midship body was of the high dead rise type, giving a sharp V-shape and considerable draft.

To Captain Peterson is due the credit for the departure from this now obsolete type of boat construction. From practical knowledge of the needs of the service in which these boats were engaged, he had hulls built along totally different lines. They were about three beams in length. In other words, a hull 50 feet long would be, say, 16 feet beam. The midship section was changed from the sharp rise with deep floors to flat floors with a very slight rise. The operators soon found that a small vessel built in this style would carry more, tow better, and be a more comfortable and seaworthy craft than the earlier type, and that a boat would go over the water better than through it.

The fleet of small workboats grew rapidly. The Bay of San Francisco was the birthplace of this type, and other ports soon followed the example set. From the beginning, with one boat in 1887, the fleet has grown in 37 years to a total of about 1000, in and around San Francisco Bay alone. Of course these latter figures do not include a great variety of pleasure and fishing boats, gas engine propelled. With these added the total would be more than three times the number mentioned. We are now writing only of the workboat, commercially operated for the transport of freight and passengers or for towing operations.

The operation and maintenance of this fleet means business for hull and engine builders, ship chandlers, and other marine supply houses—business well worth looking after by the mercantile and industrial firms in these lines. One firm of operators, the H. C. Peterson Company, Inc. (and there are several who have headquarters in San Francisco, of whom more will be written) now operates twenty-eight workboats, twenty-eight large barges, and three oceangoing tugs. Other firms, like the Crowley Launch & Tugboat Company and the Oakland Launch & Tugboat Company, have large fleets, and there are many contractors in wharf and dock buildings, stone and gravel supply, ballast and coal work, besides other river and harbor transportation companies who maintain workboats.

With increasing competition came the need of savings in operation. To the Pacific Coast, and San Francisco in particular, is without doubt due the credit of one man control of this type of craft. By mechanical perfection it is quite practicable for a 65-foot boat with a 100-horsepower engine to be handled by one man. Ease of starting, control of speed, steering and maneuvering have been reduced to a few simple movements.

And, now, to meet the rapid advance in the cost of lighter fuel, comes the diesel engine, which will handle the heavier and cheaper fuel oils. Already several new workboats have been built with diesel engines, some of the "semi" type and others the "full." Both have their adherents, and both have advantages. Also a large number of boats have been converted from gasoline engine to diesel engine drive.

Better design and more scientific construction have resulted in the production of workboat, multi-cylinder, heavy duty oil engines which show an operating economy of a high order. Demand for the best will spur on the designer and builder to even better results. We have as yet only commenced to fathom the possibilities of the future.

As one of the principal operators concisely expressed it to a Pacific Marine Review writer, "The gas or distillate engine is obsolete. The diesel must be used in the future. And at that, only the best will do. Margin of profit demands close check on fuel consumption. The problem of handling the diesel engines readily has been solved. Economy is now the factor."

Pacific Coast Sets the Standard

The workboat, one man controlled, as developed on the Pacific Coast, has become a standard for other places. A well known superintendent-engineer from the Eastern Coast was in San Francisco recently looking over the workboat fleets with view to embodying special points of excellence in some prospective boats for his company. Comparing the handiness, sturdiness, and adaptability of the Pacific type with that of the Atlantic, this gentleman was warm in his praise of the former. Not only the hulls, but the engines and general layouts are superior. Some of the Eastern engines are of, perhaps, somewhat higher finish and from an artistic point of view more pleasing, but when it comes down to good hard work and economy of operation the Pacific Coast product is hard to beat.

CAPTAIN HENRY C. PETERSON

CAPTAIN PETERSON was born in San Francisco in 1863. His father, the late Harry Peterson, was one of the first operators of the early Whitehall boats, which for many years were a feature of the bay business. From his earliest youth the subject of this sketch has been identified with the boating business. When but a small lad, barely tall enough to peer over the gunwale of a Whitehall, he accompanied his father on trips to and from the ships on the Bay.

When eighteen years of age he was champion Whitehall and shell oarsman of the Pacific Coast. He later went East and to England, and but for a mistake on the part of his manager, might have been champion oarsman of the world. He was defeated but once, by O'Connor. However, he holds undefeated records for one fourth mile, 1 minute, 16 seconds; and for three miles, 19 minutes, 1 second.

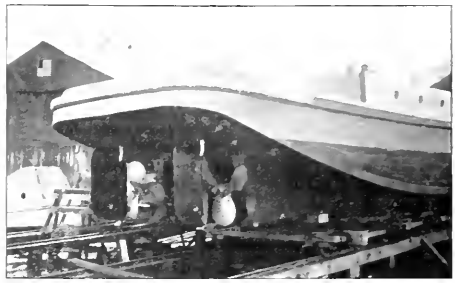
Quitting the racing game as a professional oarsman, he took up his old business of waterfront and harbor work, carrying it on with success until 1917, when he retired from active participation in the management. He is, however, often called on by the company to give expert advice and counsel. At present Mr. Peterson is enjoying a well earned rest at his beautiful home in Los Altos, but delights in meeting his old-time friends and talking of old days. Hale and hearty, with a cheery smile and kind word for all, Captain Henry C. Peterson at sixty-two is a splendid figure of a man, admired and respected by his host of friends. He is loath to tell stories where he has been the hero, but during his many years on the front he has saved numbers of seafaring folk from death in the waters of the Bay.

Some of Captain Peterson's best friends are those who learned the business from him, and all say that to him is due much of the progress of the workboat on San Francisco Bay.

A NOTABLE BOAT YARD

OBVIOUSLY without the builder there would be no workboats. There are many firms around San Francisco that have specialized in this class of craft, and not the least prominent is the firm of Anderson & Siemer, whose yard at South San Francisco has been noted for the quality of work turned out.

Captain H. Anderson, known to all the waterfront as "Pop" Anderson, started the yard in 1893. Since that time some 420 hulls have been built at the works, besides numberless repair jobs. Captain Anderson, a fine type of the old-time ship carpenter, is of Danish birth and well on toward his seventies. But he is on the job at all times, hale and able. About four years ago, A. H. Siemer became associated with the company, taking an active part in its control. They are just now completing what is said to be the largest marine railway on the San Francisco side of the Bay, it being capable of hauling out a 200-foot boat of 700 tons deadweight. Several new boats and many repair jobs are now under way at this yard, among which are the following:



Above are two views at the Anderson & Siemer yard, San Francisco, showing the new workboat Solano ready for launching. In the lower picture Miss Betty McDonald, the granddaughter of N. Fay, owner of the boat, is shown ready to break the bottle. Above are shown the lines of the Peterson No. 5, one of the older style workboats, which is being altered to take a larger engine. Note the difference in line, especially in dead rise.

The twin-screw workboat **Solano**, launched on September 14 at **Anderson & Siemer's Yard**, was built to the order of **N. Fay & Son of Rio Vista** and will be operated in the hay and river trade. She has been specially designed for light draft. Her engines are two 75 i. h. p. diesels, built by the **Atlas Imperial Engine Company**, Oakland, which will give her good speed and power. The sponsor of the Solano was little Miss Betty McDonald, the granddaughter of N. Fay. The little lady took the whole ceremony quite seriously and with a dignity seldom attained by some of the older ladies in similar roles. Pacific Marine Review hopes that both Miss McDonald and the Solano will have a prosperous and happy future.

The stern-wheel steamer **Dauntless** will soon be hauled out. She will be lengthened 16 feet at the stern and practically rebuilt at a cost around $50,000. When the repairs are done, the **Bay Transportation Company** will have a very serviceable and handy vessel, and one perhaps better than new.

A fine staunch craft, built on the conventional lines of the workboat but to be used principally for hunting, is nearing completion at **Anderson & Siemer's yard.** She has been built to the order of **Henry Cailleaud** of the California Meat Company.

MODERN TRANSBAY FREIGHT HANDLING

IN these busy days few people realize the importance of local transportation as affecting intimate daily life of our modern communities. Particularly is this true with such large cities as those lying adjacent to each other on each side of San Francisco Bay. There, food stuffs in particular and many other requirements of daily use have to be moved promptly and in constantly increasing volume.

The Bay Cities Transportation Company has for nearly twenty years been an important factor in the movement of all kinds of freight across San Francisco Bay. With the constantly increasing volume, Al T. Gibson, president, and J. J. Lankin, general manager of this progressive firm, came to realize about a year ago that the old methods of handling freight were entirely inadequate, and as a result they investigated modern mechanical handling devices, with a view of securing more efficient methods and keeping up to date with the progress of the communities.

After considerable study they decided on the multiple platform system, wherein freight is placed directly on separate wooden skids or platforms by the draymen. These platforms are 12 inches high. This keeps all freight up off the floor and reduces spoilage, especially where large quantities of food stuffs, such as flour and cereal products, are handled. Also the draymen find it easier to load the platforms than to place the freight on the floor and much easier to take the freight from the platforms than to pick it up from the floor. The Bay Cities Transportation Company is now using about three hundred of these wooden platforms, which are about 4 feet wide by $6\frac{1}{2}$ feet long, accommodating $1\frac{1}{2}$ to $2\frac{1}{2}$ tons each, depending upon the nature of the freight.

Elwell-Parker electric trucks handling platforms from barge to dock.

In order to handle these platforms quickly on steep grades, as well as with level floor conditions, the Bay Cities Transportation Company, after extensive demonstrations by Ira G. Perin, purchased two Elwell-Parker 2-ton elevating platform trucks and after using these trucks for about six months, purchased two additional ones to keep pace with its constantly increasing business.

The transportation company operates on a definite schedule, giving two trips each way per day between San Francisco and Oakland, using barges and tug boats for the transportation of freight. The old method in its handling operations was to truck the freight by hand, with two-wheeled dock trucks, from the floor of the dock to the floor of the barge, removing it from the barge in the same manner at destination. The system which has been in use for the past year eliminates entirely the use of hand trucks and keeps freight at all times, while in transit, on wooden platforms. This system permits all trucking to be done by power trucks.

In comparing the old system with the new, we find that formerly seven men were able under favorable circumstances to truck twenty tons per hour from the dock onto the barge or vice versa; by the new method, one man with an electric truck is able to move sixty platforms per hour from the dock to barge or vice versa. In other words, one man, with an Elwell-Parker electric truck using the platform system, can handle in 12 minutes as much tonnage as seven men, with hand trucks, could handle in an hour.

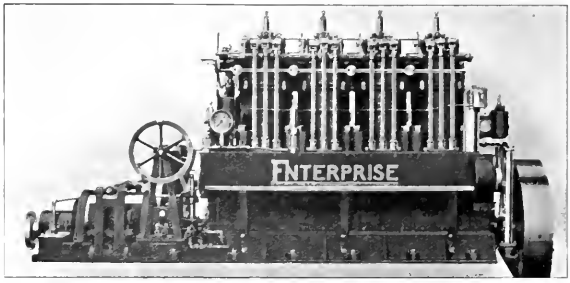
This very marked saving in time and in labor costs enables the transportation company to offer faster and more frequent service so that freight can be loaded direct from dray to barge and almost never has to be left on dock over a trip. The prompt dispatch minimizes loss and breakage claims, which are very important factors in freight transportation costs. As a result of this successful application of modern freight handling methods, the Bay Cities Transportation Company has for some time offered over night service and through-billing on the noon barge from Oakland to Stockton and all points on the Central California Traction System—to Antioch, Benicia, and all points on the river system of the California Transportation Company—and to Petaluma and all points on the Petaluma and Santa Rosa Railroad.

View on the dock of Bay Cities Transportation Company, showing freight stowed on platforms ready for movement.

WESTERN-ENTERPRISE MERGER

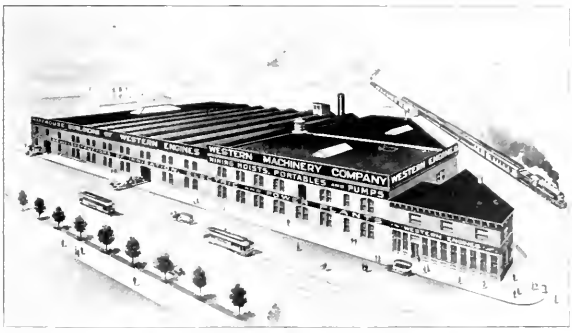
Diesel Engine Builders Join Forces, Creating Largest Organization of Kind in West

THE merger between the Enterprise Engine Company of San Francisco and the Western Machinery Company of Los Angeles is a matter of vital importance to every power using industry throughout the entire West. For this merger brings together two of the largest and foremost builders of internal combustion engines on the Pacific Coast, and creates for the western states an organization of first magnitude having engineering, manufacturing, and distributing facilities adequate for the complete power requirements of this section of the country.



The Western-Enterprise marine type diesel engine fitted with reversing clutch.

Both the principals to this merger are well and favorably known throughout power and engineering circles of this and foreign countries, where their various products are accorded honored positions among the world's leading power equipments.

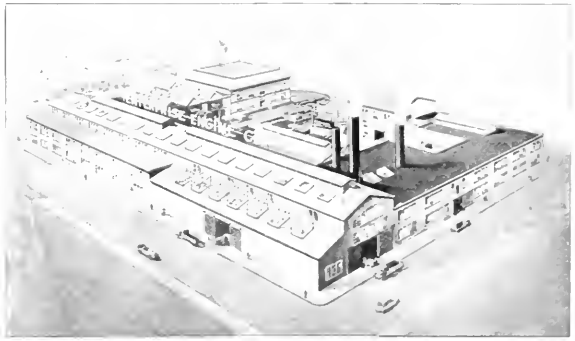


The Los Angeles plant of the Western-Enterprise merger.

The Western Machinery Company is the older in point of years, of the two companies, having started in the manufacture of internal combustion gas and gasoline engines approximately a quarter of a century ago as the Western Gas Engine Corporation at the site of their present plant number one in Los Angeles. Located in the heart of intensive oil and agricultural development, their products were of a more or less specialized nature to meet the needs of these particular industries.

From its very inception, the company was successful in producing an engine that was considerably above the average in efficiency, economy, and dependability, and the name "Western" in engineering circles soon became synonymous with efficient, dependable power. The rapid success achieved with their original type of engine created a demand for engines of the better class, designed for other classes of service so that the company began adding to their line various types of engines for different power requirements.

The growth and success of the Western Machinery Company during the twenty-odd years of its existence is common knowledge throughout the power world. First successfully invading local fields, the company soon branched out into broader markets. Foreign distribution eventually was decided upon and the same qualities of efficiency, economy, and dependability that characterized Western engines in the American fields under domestic conditions, found favor among power users in Europe, South America, the Far East, and the Orient. With the expansion in sales, manufactur-



The San Francisco plant of the Western-Enterprise merger

ing facilities were forced to keep pace, with the result that the organization grew rapidly until at the present time there are three large factories in operation, each one fully equipped and independent of the others, producing Western engines of various types.

The Enterprise Engine Company had its inception in the early part of the year 1916 in San Francisco. Like the Western Machinery Company, the Enterprise Engine Company's original product was a gasoline or distillate engine of modern type. While the engine was designed primarily for marine purposes, it also was built in the stationary type. From the beginning the Enterprise engine also proved extremely popular among power users, due to its efficient, reliable, and economical operation in hard service, and the steadily increasing demand resulting therefrom brought rapid expansion and enlarged manufacturing facilities.

Natural progress in the development of their various types of engines, coupled with the changing conditions in the fuel oil markets, resulted in the course of time in the production by both companies of engines of the diesel type, which have won world wide distinction. While the Western Machinery Company devoted most of their efforts to diesel engines of the stationary type, the Enterprise Engine Company intensified their efforts upon the marine type, both of which are now in service in large numbers in widely distributed power centers.

It was at this period in the history of both companies that the first contract of importance occurred between the parties to the present merger, an agreement being reached whereby the Western Machinery Company permitting the Enterprise Engine Company to use the diesel engine which had been developed by the former and used to a great extent in the stationary field. This engine was changed over by the Enterprise Company to conform with marine requirements, and the extensive list of owners of Enterprise diesel marine engines and the records of these engines in service over a period of years in hard, continuous service attests the wonderful success in this endeavor.

The officials of the Enterprise and Western companies, who will be actively identified with the new organization, are as follows:

Western Machinery Company: William Angus, president and general manager; George F. Guy, vice-president; San Kahn, treasurer; W. R. Hale, secretary; J. M. Davis, sales manager; John H. Suter, chief engineer.

Enterprise Engine Company: Charles J. P. Hoehn, president; H. E. Morgan, vice-president; A. J. Martens, treasurer; William J. Donlon, secretary; Henry Martens, director.

The headquarters of the new company will be located at Los Angeles.

The merger of the two concerns was brought about for the purpose of enlarging the manufacturing facilities in harmony with the increasing power requirements of the Pacific Coast and western states; enlarging and extending the distribution of the various products of both companies, and increasing and improving the facilities for service to power users to the maximum extent possible.

With the complete facilities of both companies combined and reorganized, according to present plans, the Western Machinery and Enterprise Companies are destined to be a most important and valuable factor in the industrial activities of the entire western United States, bringing this section of the country much nearer to a realization of manufacturing development on a par with other leading industrial centers throughout the world.

The Alaska Salmon Company's tug Oneida towing barges in Alaskan waters.

TOWING EFFICIENCY

AN interesting experiment has been carried out on the steam tug Oneida of the Alaska Salmon Company of San Francisco, which shows the possibilities of improvement of propellers in towing service.

The Oneida is a wooden tug 60 feet long, 14.5 beam, and 5.3 feet deep; she has a Scotch boiler and compound engine 9 inches by 17 inches bore by 12 inches stroke, rated 200 r. p. m., and burns coal.

A Cloverleaf propeller made by the Bethlehem Shipbuilding Corporation, San Francisco, was fitted, which was the same diameter and pitch as the one replaced, and a reduction in fuel and better towing speed were quite apparent. She had used 2.5 tons of coal per day and this dropped to 1.5.

The engineer of the tug then dropped the steam pressure from 140 pounds to 110 pounds with a still further saving. The gain in efficiency was so apparent that the superintendent decided to double the day's work of the boat, which was one round trip of 22 miles per day towing two barges and handling them at both ends of the trip.

Starting from cold the over-all results were as follows:

Old propeller: 140 pounds steam. 154 towing miles per week, fuel 15 tons.

Cloverleaf propeller: 110 pounds steam, 286 towing miles per week, fuel 15 tons.

Old propeller: fuel per towing mile 1.9 pounds, single trip 1 hour 30 minutes.

Cloverleaf propeller: fuel per towing mile 1.05 pounds, single trip 1 hour 15 minutes.

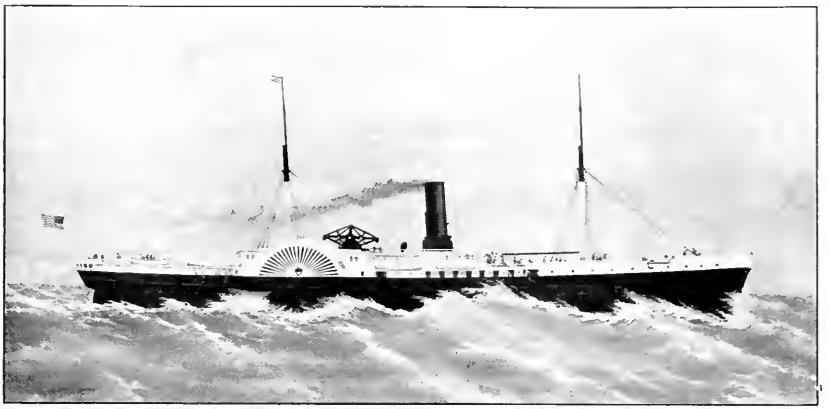
Reduction in fuel per towing mile, 45 per cent.

Besides towing faster the tug runs faster light, steers backing, and can accomplish more work in every way.

The following letter was recently received from J. F. Hidzick, marine superintendent of the Alaska Salmon Company:

"The Cloverleaf propeller installed on our steamer Oneida has proved satisfactory in every way.

"Besides a large saving in fuel and in coaling time, the boat can accomplish more work with the new wheel."



The paddle wheel steamer Golden Age of the New York and Australian Steam Navigation Company. The Golden Age was the first steamer to cross the Pacific Ocean, running from Melbourne to Panama, in 1854

WITH THE TRANS-PACIFIC MAILS

From San Francisco to the Antipodes

By WILL LAWSON

THE oldest route from San Francisco to Sydney is that which goes by way of Tahiti and New Zealand. The calm weather experienced over the greater part of the distance and the prevailing trade winds made it a popular sea road for the early steamers, which carried considerable sail to assist the steam. It is seventy years since the first mail and passenger steamer crossed the Pacific by this route. And though her port of arrival in America was Panama and not San Francisco, that was due to the fact that the trans-continental railway was not completed, while there was a short, American-owned line operating across the Panama Isthmus.

The steamer referred to was the Golden Age, belonging to the New York and Australian Steam Navigation Company. The proposal was to run between Australia and Panama, and eventually to make San Francisco the home port. Five other vessels were to be built and a regular service maintained. This project was typical of the enterprise shown in the United States in regard to steam lines in the Pacific at that time. China and Japan were also being linked up with Panama by similar American steamer lines.

The Golden Age

The ships employed were of typical American design. The Golden Age was a wooden vessel, 285 feet long, 43 feet 6 inches beam, and with a depth of hold of 32 feet. Her net register was 2864 tons. She was built at New York by H. Brown, her lower frames being of live oak and top frames of locust and cedar. Her entire hull was double-diagonally braced with iron bars.

The Golden Age had accommodations for 1200 passengers in three classes, the steerage taking 600. Three saloons took up a good deal of space. They were handsomely finished, two being panelled in rose, satin, and zebra woods, with crimson and gold plush furnishings and plenty of mirrors. The upper saloon was somewhat the same, but finished in white and gold.

The engine was a single beam with an 85-inch cylinder and side paddles 35 feet in diameter. Her crank had a 12-foot throw and her boilers worked at a pressure of 20 pounds of steam. She had two boilers, each 40 feet long with furnaces at each end, smoke flues in the center, and one smoke stack.

First Voyage

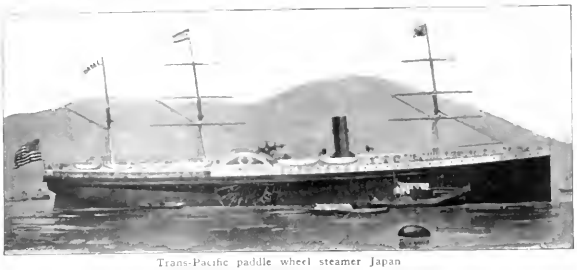
The Golden Age left New York in charge of Lieutenant D. D. Porter of the U. S. Navy on December 30, 1853, and arrived in the Mersey on January 12, 1854. Other paddle steamers of similar design were being run across the Atlantic by the Collins Line. But the Golden Age was destined for the Pacific trade, and as rapidly as could be she was loaded with cargo and took on board a large number of passengers bound for the gold diggings in Australia.

The steamer reached Melbourne on February 20, 1854, and after discharging she was loaded for Panama. She called at Sydney on her way, final departure being taken from Sydney on May 11 at 11 a. m. Every cabin was occupied. She also took a valuable consignment of gold dust and a heavy letter mail. A gun was fired and bugles blown as this, the first trans-Pacific mail steamer, ploughed her way out of the Sydney Heads and steered away for Panama via Tahiti. Though she passed through Cook's Strait she did not call at Wellington, as there was no wharf there and no coaling station.

The Golden Age took 13 days and 6 hours to reach Tahiti and from there to Panama the time was 19 days. Her lowest daily run was 220 knots and her highest 272, using Australian coal. At Papeete she took on 1500 tons of soft coal, and her lowest and highest runs fell respectively to 200 and 270 knots. The amount of coal consumed on the voyage was 2600 tons, which cost $20 a ton. Owing to the high cost of coal the loss on the round voyage was $50,000.

Subsidy Needed

In reporting on the venture, Lieutenant Porter said that until coal could be provided in New Zealand at a moderate cost, the Panama



Trans-Pacific paddle wheel steamer Japan

route must be abandoned unless a mail subsidy of $4.50 a mile could be secured. The actual distance logged between Sydney and Panama was 9862 miles.

This unprofitable voyage checked the ardor of an Australian concern, styling itself the Australasian, Pacific Mail Steam Packet Company. This firm had six screw steamers ready of about 1500 tons and 300 horse power. They were to run via Panama, connecting with the rail and the West India Royal Mail boats. The outbreak of the Crimean

The paddle-wheeler Nebraska at the dock

The Mongol, one of the first Pacific Mail screw steamers

war stopped effectually the company's operations, as the vessels were all taken as transports, and the steam lines across the Pacific were abandoned, as far as the southern portion of that ocean was concerned, until the 'sixties, with the exception of stray small vessels which found their way across on various occasions.

British Effort

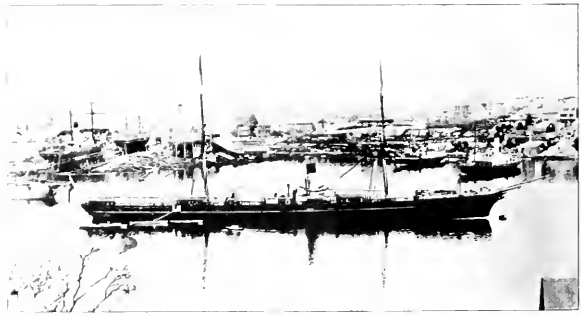
In 1866 the Panama, New Zealand and Australian Royal Mail Company was formed to run 1500-ton steamers. These were the Kaikoura, Ruahina, Rakaia, and Mataura. They were 260 feet long and were brig-rigged. Instead of calling at Tahiti, these steamers were coaled at a station which the company established at Rapa, an island lying 700 miles to the southeast of Tahiti. This was done to enable them to avoid the head winds. The saloon fare from Wellington to Panama was £65 ($325), which is about the same as the fare charged from Sydney to San Francisco today.

Shift to San Francisco

The opening of the trans-continental railway to San Francisco in 1868 made the California port the shipping center of the Pacific Coast. The fevers contracted by passengers in crossing the Panama Isthmus had already made the line unpopular, so it ceased business soon after the railway came through over the Sierra Nevada, and the trans-Pacific traffic took a new lease of life, with San Francisco as the port of arrival and departure in the United States.

A report on the best route for these services was made to the British Government by Lieutenant G. A. Woods, Colonial Mail Surveyor, in 1869. He selected the same route as did the owners of the Golden Age, except that San Francisco was substituted for Panama.

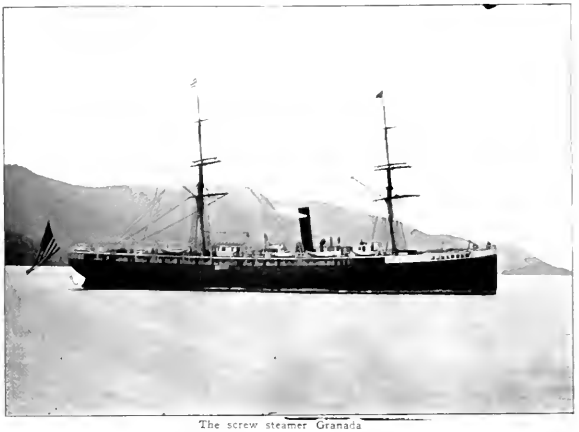
"Assuming Sydney to be the port of departure and Wellington and Tahiti the ports of call," wrote Lieu-



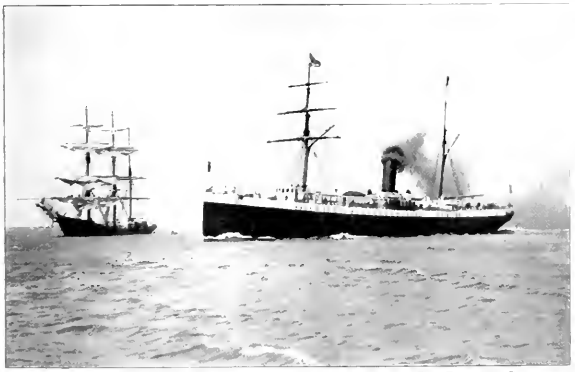
The screw steamer Rakaia of the New Zealand-Australian Royal Mail Company, one of the first four screw steamers on the Pacific Ocean

tenant Woods, "the distance would be 7190 miles. This is only 50 miles longer than if Auckland was made the New Zealand port of call, and by calling at Wellington (which is further south) all the advantages of the prevailing westerlies south of the equator would be gained. These winds would carry the steamers well into that part of the Pacific where the trade winds are regularly established throughout the year." This route is used today, and the trade winds are a refreshing feature of the voyage in the tropics.

Another claim for the Tahiti route at that time was that a lighthouse had been built at Point Venus, near Papeete, in 1857, while on the Fiji and other routes there was scarcely a light to guide the steamers through the maze of islands, which often were low-lying and dangerous.



The screw steamer Granada



The Oceanic Steamship Company's Mariposa steaming down San Francisco Bay

With California linked up with the East and Middle West by the new railway, it was natural for enterprising Americans to turn their attention to steam communication across the Pacific. A fleet of 3000-ton paddle-boats was put on the China and Japan routes. Then it was realized that the quickest way from Sydney to London lay across the United States.

Regular Liner Service

In 1870 the first San Francisco-Sydney service was started. It was the beginning of a 50-years' war with time and distance, the history of which is a record of ambitious aims and fast passages. Pending the launching of a big scheme, H. H. Hall, American consul at Sydney ran a temporary service with some small screw steamers, the Rangatira and Balclutha. These ran as far as Honolulu, where they connected with the Northern Pacific Company's vessel Ajax. The City of Melbourne and Wonga Wonga, bigger boats, soon replaced the Rangatira and Balclutha. In the following year the Californian Line, owned by Webb & Holliday, opened a service to Australia with four big paddle steamers, the Nebraska, Nevada, Dakota, and Moses Taylor. They were very like the Golden Age in size and appointments and speed. The News of the World of San Francisco thus described them at the time of their arrival at San Francisco.

Last of the Paddlers

"The Nevada and Nebraska are

(Continued on page 526)

The Oceanic Steamship Company's steamer Sonoma as she originally appeared

TRADE AND TRAFFIC TRENDS

Department Devoted to the Interests of Exporters, Importers, and All Ocean Shippers

NEW "GOODS BY SEA" BILL

British Parliament Enacts New Rules Imposing Liabilities On Sea Carriers

By TRADE COMMISSIONER MOWATT M. MITCHELL

THE new bill entitled "Carriage of Goods by Sea" has now passed both Houses of Parliament and becomes effective on a date to be fixed by an order in council. The object of the law is to bring British shipping practice into line with the outcome of the Internatonal Conference on Maritime Law held in Brussels in October, 1922, and October, 1923. At the first conference the delegates agreed unanimously to make various representations to their respective governments. At the second conference a draft convention for the unification of certain rules relating to bills of lading was amended and adopted. It is to give these rules so amended the force of law in Great Brotain that the present law has been passed, "with a view to establishing the responsibilities, rights, and immunities attaching to carriers on the bills of lading."

As far as the period of voyage is concerned, the clauses in bills of lading which have relieved shipowners from responsibility for negligence will entirely disappear and in their place will be the rules which, in the schedule, follow the law proper and which are The Hague rules of 1921 as revised and modified. These standard conditions will impose on sea carriers liabilities that are irreducible; that is, no other clause in the bill of lading will be able to lessen the carrier's liability, although carriers will be free to surrender, by special clause in the bill of lading, any of the rights and immunities allowed to them by the rules.

Liability for Seaworthiness

On the other hand, clause 2 of the law proper states "there shall not be implied in any contract for the carriage of goods by sea, to which the rules apply, any absolute undertaking by the carrier of the goods to provide a seaworthy ship."

It was over this clause only that discussion arose in the passage of the bill through either house, and the objection was raised by certain members of the Labor Party on the ground that it relieved shipowners of the necessity of providing ships fit for seamen to trust their lives in. In reply to these criticisms Mr. Sidney Webb, president of the board of trade, explained that this clause did not remove any liability under the merchant shipping act, but merely defined the obligation by which any carrier was held to guarantee the shipper that his goods should be carried safely. He pointed out that paragraph 2 of clause 6 specifically states "nothing in this act shall affect the operation of sections 446 to 450, both inclusive, 502 and 503 of the merchant shipping act, 1894, as amended by any subsequent enactment or the operation of any other enactment for the time being in force limiting liability of the owners of seagoing vessels."

In other words, the owners of seagoing vessels are still required to guarantee their seaworthiness and safety to the board of trade but not to the individual carrier or carriers for whom they are transporting goods.

Protection Assured to Third Parties

The reason for the apparently one-sided stipulation that while the liabilities and obligations imposed on sea carriers may not be reduced beyond the minimum stated in the bill, the sea carrier may, by election, abrogate certain of his rights and immunities, is because of the large international dealings in bills of lading by third parties, such as bankers and indorsees, who can not be expected to be privy to the technicalities of sea carriage, and who will thus be protected by the fact that there will be an irreducible minimum of liability on the part of the carrier for the period of the voyage which no other term of the bill of lading or agreement between shipper and carrier can alter.

By thus facilitating dealings in bills of lading and insuring the terms of the bill to be enforceable if claims arise, it is hoped that national and international trade relations will be facilitated and improved.

More Important Provisions of the Law

Clause 1 of the bill provides its stipulations shall be applicable to the carriage of goods by sea in ships from any port in Great Britain or Northern Ireland to any other port, whether in or outside Great Britain or Northern Ireland.

The next important clause, No. 5, has to do with the weight or count of cargo inserted in the bill of lading when ascertained or accepted by a third party other than the carrier or the shipper and states that under these circumstances, notwithstanding anything in the rules, the bill of lading shall not be deemed to be prima facie evidence against the carrier of the receipt of goods or the weight or count so inserted in the bill of lading, nor shall the accuracy thereof at the time of shipment be deemed to have been guaranteed by the shipper.

"Carrier," "Contract," "Goods," "Ship," and "Carriage" Defined

In the provision in the schedule attached to the major part of the bill it is declared that "carrier" includes the owner or the charterer who enters into a contract of carriage with the shipper; that "contract of carriage" applies only to contracts of carriage covered by a bill of lading or by any similar document of title—in so far as such document relates to the carriage of goods by sea included in bill of lading or any similar document as aforesaid, issued under or pursuant to a charter party—from the moment at which such bill of lading or similar document of title regulates the relations between a carrier and a holder of the same; that "goods" includes goods, wares, merchandise, and articles of every kind whatsoever, except live animals and cargo which by the contract of carriage is stated as being carried on deck and is so carried; that "ship" means any vessel used for the carriage of goods by sea; and that "carriage of goods" covers the period from the time when the goods are loaded to the time when they are discharge from the ship.

Ship Conditions, Stowage, and Bill of Lading

Article 3 of the schedule states that the carrier shall be bound before and at the begining of the voyage to exercise due diligence to make the ship seaworthy; to properly man, equip, and supply the ship; to make the holds, refrigerating and cool chambers, and all other parts of the ship in which goods are carried fit and safe for their reception, carriage, and preservation; and that, subject to the provisions of article 4, the carrier shall properly and carefully load, handle,

stow, carry, keep, care for, and discharge the goods carried.

Paragraph 3 of article 3 states that after receiving the goods into his charge the carrier, or the master, or agent of the carrier shall, on demand of the shipper, issue to the shipper a bill of lading, showing, among other things, the leading marks necessary for identification of the goods, as the same are furnished in writing by the shipper before the loading of such goods starts, provided such marks are stamped or otherwise shown clearly on the goods, if uncovered, or on the cases or coverings in which such goods are contained, in such a manner as should ordinarily remain legible until the end of the voyage; either the number of packages or pieces or the quantity or weight, as the case may be, as furnished in writing by the shipper; and the apparent order and condition of the goods. It is provided, however, that no carrier, master, or agent of the carrier shall be bound to state or show in the bill of lading any marks, number, quantity, or weight which he has reasonable grounds for suspecting not accurately to represent the goods actually received or which he has had no reasonable means of checking. It is declared that such a bill shall be prima facie evidence of the receipt by the carrier of the goods as therein described.

The shipper shall be deemed to have guaranteed to the carrier the accuracy of the time of shipment, of the marks, number, quantity, and weight as furnished by him, and the shipper shall indemnify the carrier against all loss, damages, and expenses arising or resulting from inaccuracy in such particulars. The right of the carrier to such indemnity shall in no way limit the responsibility and liability under the contract of carriage of any person other than the shipper.

In the matter of claim for loss the law states that unless notice of loss or damage and the general nature of the loss or damage be given to the carrier or his agent at the port of discharge before or at the time of the removal of the goods into the custody of the person entitled to the delivery thereof under the contract of carriage or, if the loss or damage be not apparent, within three days, such removal shall be prima facie evidence of the delivery by the carrier of the goods as described in the bill of lading. Notice in writing need not be given if the state of the goods has at the time of their receipt been the subject of joint survey or inspection. In any event the carrier and the ship shall be discharged from all liability in respect of loss or damage unless suit is brought within one year after delivery of the goods or the date when the goods should have been delivered. In case of any actual or apprehended loss or damage the carrier and the receiver shall give all possible facilities to each other for inspecting and tallying the goods.

Relief of Carrier Under Certain Conditions

Paragraph 8 of article 3 of the schedule is the pertinent one; it provdies that any clause, covenant, or agreement in a contract of carriage relieving the carrier or the ship from liability for loss or damage to or in connection with goods arising from negligence, fault, or failure in the duties and obligations provided in this article or lessening such liabilities otherwise than as provided in these rules, shall be null and void and of no effect; but a benefit of insurance or similar clause shall be deemed to be a clause relieving the carrier from liability.

Paragraph 1 of article 4 provides that neither the carrier nor the ship shall be liable for loss or damage arising or resulting from unseaworthiness unless caused by want of due diligence on the part of the carrier to make the ship seaworthy, to secure its proper manning, equipment, and supply, and to make the holds, refrigerating and cool chambers, and all other parts of the ship in which goods are carried fit and safe for their reception, carriage, and preservation. Whenever loss or damage has resulted from unseaworthiness the burden of proving the exercise of due diligence shall be on the carrier or other person claiming exemption under this section.

Contractual Conditions

Paragraph 2 provides that neither the carrier nor the ship shall be responsible for loss or damage arising or resulting from act, neglect, or default of the master, mariner, pilot, or the servants of the carrier, in the navigation or in the management of the ship; or from fire, unless caused by actual fault or privity of the carrier; or from perils, damages, and accidents of the sea or other navigable waters; from acts of God, acts of war, or acts of public enemies; from arrest or restraint or princes, rulers, or people, or seizure under legal process; from quarantine restrictions, act or omission of the shipper or owner of the goods, his agent or representative; from strikes or lockouts, or stoppage or restraint of labor from whatever cause, whether partial or general; from riots and civil commotion; from saving or attempting to save life or property at sea; from wastage in bulk or weight or any other loss or damage arising from inherent defect, quality, or vice of the goods; from insufficiency of packing, insufficiency or inadequacy of marks, latent defects not discoverable by due diligence; or from any other cause arising without the actual fault or privity of the carrier, or without the fault or neglect of the agents or servants of the carrier; but the burden of proof shall be on the person claiming the benefit of this exception to show that neither the actual fault or privity of the carrier nor the fault or neglect of the agents or servants of the carrier contributed to the loss or damage.

Miscellaneous Provisions Regarding Liability

Paragraph 3 of article 4 provides that the shipper shall not be responsible for loss or damage sustained by the carrier or the ship, arising or resulting from any cause without the act, fault, or neglect of the shipper, his agents, or servants.

The remaining paragraphs of article 4 cover the usual clauses as to the right of the ship to deviate from her prescribed course for the purpose of saving life or for any other reasonable purpose; limits the loss on any one package to £100 unless previously declared; and makes the customary provisions as to shipment of explosives.

Special Agreements Allowable

Article 5 declares the carrier shall be at liberty to surrender wholly or in part all or any of his rights and immunities or to increase any or all of his responsibilities and liabilities under the rules contained in any of these articles, provided such surrender or increase shall be embodied in the bill of lading issued to the shipper; it also provides that nothing in these rules shall be held to prevent the insertion in a bill of lading of any lawful provision regarding general average.

Article 6 provides that, notwithstanding the provision of preceding articles, a carrier, master, or his agent, and the shipper shall in regard to any particular goods be at liberty to enter any agreement, in any terms, as to the responsibility and liability of the carrier for such goods; as to the rights and immunities of the carrier in respect of such goods or his obligation as to seaworthiness, so far as this stipulation is not contrary to public policy; or the care or diligence of his servants or agents in regard to the loading, handling, stowage, carriage, custody, care, and discharge of the goods carrier by sea; provided that in this case no bill of lading has been or shall be issued, and that the terms agreed shall be embodied in a receipt which shall be a non-negotiable document and shall be marked as such. Any agreement entered into as above shall have full legal effect; provided that this article shall not apply to ordinary commercial shipments made in the ordinary course of trade.

Shippers' Objections Overcome—Carriers Approve

In the original drafting of this new bill various objections were raised by the coasting trade, the coal trade, and part of the timber trade; but these objections were overcome in conference, and it is believed that the bill as now drawn and passed will have the general approval of the shipping and carrying trade. In fact, one big shipping firm—Messrs. Furness Withy & Co.—have already issued more than 50,000 bills of lading incorporating The Hague rules, which are practically similar to those contained in the new bill, without a single case of litigation or even a dispute, as to the meaning and construction of the term. —(Commerce Reports.)

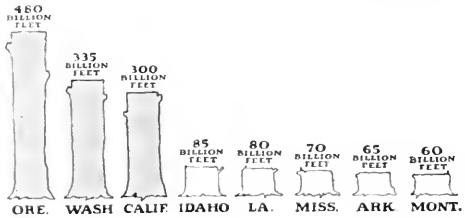
LUMBER—BUILDER OF PACIFIC COAST SHIPPING

I.—THE LAST GREAT STAND

An Account of the Saw Timber Resources of the Territory Tributary to the Pacific Coast Ports of the United States

COMMERCE, wealth, and population are experiencing great growth on the Pacific Coast these days, and the long foretold time is fast approaching when the hub of world trade in its march westward will have arrived at the eastern shore of the Pacific Ocean. Many factors are conspiring to this end, and among them timber and the lumber industries hold a very important, if not the first, place. In the building up of sea trade and in furnishing bulk cargo, lumber is already at the head of the list. So, in this series of articles on Builders of Pacific Ocean Commerce, we are according the premier position to lumber.

LEADING STATES IN TIMBER RESOURCES



One hundred years ago the vast conifer forest that stretched along the Pacific Coast from San Francisco Bay almost to Bering Straits was a mysterious wilderness, visited in spots inland by a few venturesome trappers and hunters or in spots on the coast by an occasional ship looking for fresh water or for trade in furs.

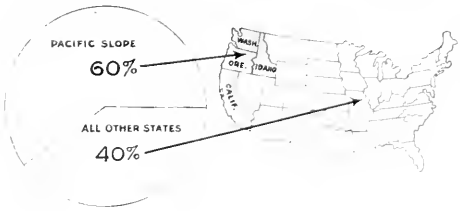
Washington Irving writes of this region as a "wilderness that will never be fit for human habitation", where trees hundreds of feet high stand "so close together as to make passage through the forest impossible." Bryant sings, "Lose thyself in the continuous woods where rolls the mighty Oregon, and hears no sound save its own dashings." The statesmen who completed the treaty with England, which defined the northern boundary and secured the Northwest to the United States, thought the country worthless save for its fur bearing animals and its fisheries. Today it is "The Last Stand" of high class timber in the United States and for the next generation will have to meet the needs of the United States for lumber and lumber product.

The slopes of this country, directly tributary to the ports of Oregon, Washington, and California, contain 60 per cent or more of all the available standing timber of the United States, and are answering in a most wonderful way the demands now being made upon them to satisfy the insatiable appetite of the American market for lumber and also to fill a large part of the export demand from Asia and Europe.

SOFTWOOD SAW TIMBER RESOURCES OF THE GREATER WEST

	Bd. Ft.	Pct of Total Softwoods in U.S.
Douglas Fir	595,505,000,000	34
Western White Pine	249,578,000,000	14.2
Western Hemlock	95,092,000,000	5.4
True Firs	91,349,000,000	5.2
Redwoods	72,208,000,000	4.1
Idaho White and Sugar Pine	57,071,000,000	3.3
Western Red Cedar	53,348,000,000	3.1
Lodgepole Pine	43,919,000,000	2.5
Western Spruces	39,822,000,000	2.3
Other Western Softwoods	66,280,000,000	3.8
Total	1,364,172,000,000	77.9

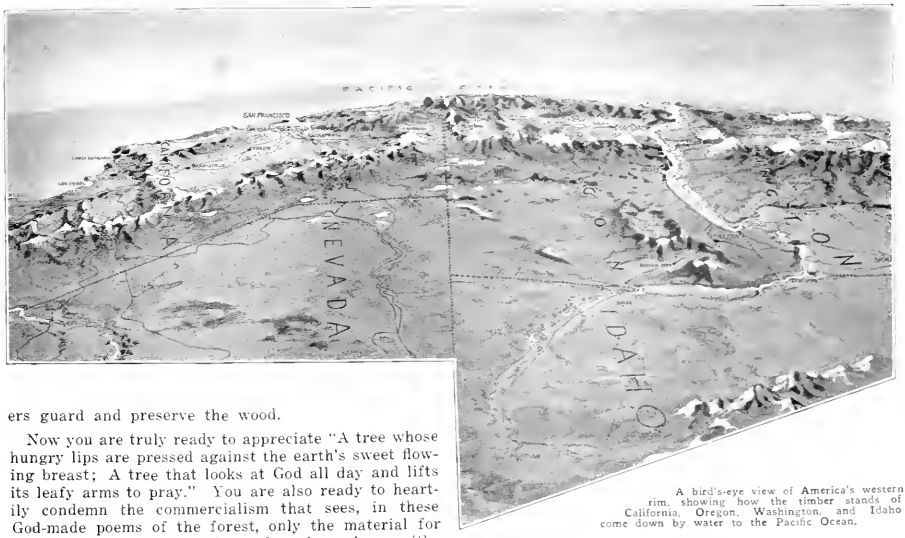
TIMBER RESOURCES OF THE UNITED STATES



The Tree

"I think that I shall never see A poem lovely as a tree" sings Joyce Kilmer, but truly beautiful as all woods are, the tree reaches its real sublimity in the spruce and redwood forests of the Pacific slope. Amid green woods and sylvan scenes it is always pleasant to lie with Longfellow, "whereever the changing boughs between shadows dark and sunlit sheen, alternate come and go." However, if you would truly know the tree, walk out alone of a summer morning on the eastern slope of some tree-clad hill bordering the Eel or the Hood or the lower Columbia, and lying flat upon the forest floor raise your eyes slowly upward over the spreading bole and massive column of the nearest giant—up, up, fifty, seventy-five, one hundred feet to the lowest limb, and then up again through the lacey branches to the feathery tip waving in a breeze you do not feel.

And there, motionless with half closed eyes, lie and bathe your very soul in the long rays of softened sunlight that filter down to you through the delicate tracery and marvelous coloring of nature's transept window. Have you the nature loving heart, there will presently come down from the treetop that great forestry expert, the tree squirrel, who, sitting daintily in a cleft of the rough bark with his great grey plume spread over his head like a canopy, will tell you how his forefathers planted these trees and how he and his broth-



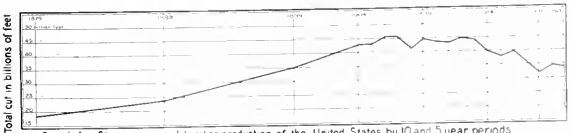
A bird's-eye view of America's western rim, showing how the timber stands of California, Oregon, Washington, and Idaho come down by water to the Pacific Ocean.

ers guard and preserve the wood.

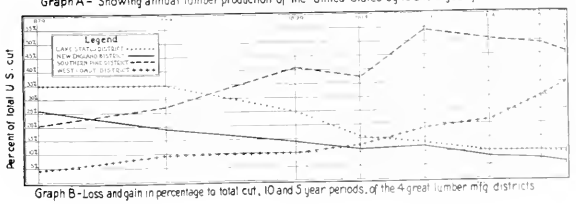
Now you are truly ready to appreciate "A tree whose hungry lips are pressed against the earth's sweet flowing breast; A tree that looks at God all day and lifts its leafy arms to pray." You are also ready to heartily condemn the commercialism that sees, in these God-made poems of the forest, only the material for producing a few more ugly modern bungalows with which to adorn the drab subdivision multiplication of the greatest town on earth. And it is just to get you into that dual frame of mind that we have introduced you first to the poetry, the beauty, the spirit of the woods, in order that you might justly appreciate the fact that, as now planned, the commercial lumber business of the Pacific Coast is on a permanent basis.

Intelligent cooperation between the State and Federal government control and private operation and ownership is working great areas to reforestation even this early in the game, and there is every reason to be assured that the Pacific Coast lumber business will not only be permanent but will have a continuous growth in volume, both for primary and secondary products.

Along with this assured permanency in lumber commerce, there has grown up a magnificent system of municipal, state, and national forest areas open to the public as playgrounds—owned, in fact, by the public. So that your children and mine, and our children's children and all the generations to follow shall not only have the materials wherewith to build their homes commercially available, but also will have free access to the primeval forest for rest and recreation of the best type.



Graph A – Showing annual lumber production of the United States by 10 and 5 year periods



Graph B – Loss and gain in percentage to total cut, 10 and 5 year periods, of the 4 great lumber mfg districts

Growth of Lumber Industry

In 1827, Dr. John McLoughlin established a primitive water power sawmill on Camas Creek near Fort Vancouver on the north bank of the Columbia. This apparently marks the first permanent lumbering business on the Pacific Coast.

A Congressional report of 1839 shows that this mill had shipped with good advantage "several cargoes of sawed lumber to the Sandwich Islands, where it sells at $55 per thousand feet." The mill employed 28 men and cut 2000 to 2400 feet of lumber daily. This daily average of 70 to 80 feet per man is interesting in the light of present performance. In 1920, Oregon and Washington employed nearly 100,000 men with a daily output per man of more than ten times that of the McLoughlin crack loggers.

In 1845, John Yessler located a mill at the present site of Seattle, and from that time on mills began to multiply. The hand loggers were followed by the "bull teams," which in turn were displaced by steam donkeys — now developed into the highly specialized steam, gas, or electric logging engine. Logging railroads, built solely for perma-

(Continued on page 525)

THE LEVIATHAN OF THE LAKES

The Largest and Fastest Side-wheel passenger Steamer on the Inland Waters of the United States, Built by the American Shipbuilding Company and Placed in Commission by the Detroit & Cleveland Navigation Company

GREATER DETROIT, the largest and speediest side wheel passenger steamer ever launched upon the inland waters of the United States, has just been completed by the American Ship Building Company, Cleveland, Ohio, and was placed in commission by the Detroit & Cleveland Navigation Company, Detroit, Michigan, on August 26.

The new steamer has 650 rooms, 26 parlors with bath, 130 staterooms with toilets. These accommodations require a great many accessory rooms not only for the use of passengers, but also for housing and maintaining the crew of over 300 officers and men.

Greater Detroit is a veritable floating hotel, a distinctive American type, and embodies the accumulation of years of experience by Frank E. Kirby, master shipbuilder, who has designed and supervised the construction of 150 steamers afloat on the inland waters of the United States and Canada.

Greater Detroit, and her sister ship Greater Buffalo, now nearing completion, cost $3,500,000 each to build, and will be operated on the Detroit and Buffalo division of the Detroit & Cleveland Navigation Company. The route traverses the whole length of Lake Erie, about 260 miles, which must be made nightly on a schedule close enough to meet the departure and arrival of trains in the terminal cities.

The great hall of the Greater Detroit

The general design of Greater Detroit follows the conventional side-wheel characteristics, but she is longer, swifter, more commodious, stronger and, if possible, safer than the vessels now in service. The length over all is 550 feet; breadth of hull over guards, 100 feet, and depth, 23 feet 6 inches. The superstructure decks are each about three-quarters of an acre in area.

All rooms are supplied with running water, and many with baths, toilets, showers, and some with both hot and cold water. To safeguard the health of passengers and crew, all water is filtered and then subjected to the ultraviolet ray, which is fatal to all germs and bacteria. Every room is provided with a telephone connected to a central station in the lobby.

Safety Devices

For the convenience of passengers, and as a safety measure, the ship is equipped with the Marconi wireless system. Fifty per cent more life-saving facilities than are required by the United States government are provided, including life preservers, life boats, rafts and floats. A complete sprinkler system with heads in all staterooms and in every portion of the boat reduces the fire hazard to the minimum. Fire detectors which automatically alarm the watchmen of a rise in temperature are installed all over the ship. Powerful searchlights and signal rockets are other measures provided for the complete safety of passengers and crew.

Deck Machinery

The vessels are each equipped with 10 by 10 spur geared wind-

The largest [illegible] wheel steamer of the world in action

lass, forward, and capstan windlass aft; two stockless anchors of 6000 pounds each, forward, and one stockless anchor of 6000 pounds weight aft, all housed in hawse pipes. The cables are 2⅛ inch Naco cast steel stud link chain, 90 fathoms to each bower and 45 fathoms to the kedge. For making fast to dock there are seven 8 by 10 mooring engines, each equipped with 90 fathoms of 1⅛ inch diameter steel wire warp.

Steering Gear

The Greater Detroit has a rudder at each end, the one at the bow being necessary to facilitate handling in the narrow waters at each end of the run. The stern rudder, which is of the balanced type, is the larger of the two and has a stock 12 inches in diameter; it is operated by twin independent steering engines acting direct on the quadrant. The bow rudder is controlled by a single direct acting steering gear; the stock of this rudder is 9 inches in diameter. These steering gears are controlled from the pilot house through shafting and gearing.

The navigating equipment, in addition to the usually adequate complement of compasses, includes a modern Sperry gyro compass and Sperry log, as well as a Haynes automatic sounding machine.

Lighting Plant

Light and power for various uses are provided by three 100 kilowatt turbo-generators, located on the main deck. All wiring is in conduit. In all there are some 5000 lights in the Greater Detroit and Greater Buffalo. Many of the operations of the galley are carried on by motor driven machines, requiring in all about 120 horsepower of motors.

Main entrance lobby and purser's offices on the Greater Detroit

Decoration

Rich simplicity is the keynote of the interior decorative scheme of this Leviathan of the Lakes. The entrance for passengers is through a large and richly decorated lobby on the main deck. Passengers entering the lobby vestibule and ascending the stairway find themselves on the promenade deck in the center of the main saloon. The highly ornate main ceiling arches are three full stories above them, and the staterooms stretch away on either hand. The paneled walls are enriched by oil paintings depicting historical scenes on the Great Lakes done by celebrated living artists. Twenty-four parlors de luxe, some with private balconies, are placed on the promenade and gallery decks. The dining room on the main deck seats 365 persons.

Hull

The hull is of steel and there are eleven water-tight compartments in the length of the vessel, and these are formed by steel water-tight bulkheads extending from keel to main deck. The double bottom is subdivided into sixteen water-tight compartments. When necessary, the bulkheads are pierced for access and the holes fitted with water-tight doors with hydraulic closing gear operated from the engine room.

The Power Plant

The power plant of the Greater Detroit and her sister ship the Greater Buffalo consists of three double-end and six single-end boilers of the ordinary Scotch marine type, fitted with Howdens forced draft and superheaters, supplying steam for a three cylinder compound inclined engine, driving feathering wheels. This is the largest Corliss type engine ever built.

All boilers are 14 feet in diameter inside, the single-end boilers

(Continued on page 77, Ad Sec.)

A stateroom in one of the de luxe suites

PACIFIC COAST PORT AUTHORITIES

Many Interesting Papers Were Read Before the Convention of the Pacific Coast Association of Port Authorities, Held at Seattle on September 3rd and 4th. For the Convenience of Our Readers, We Here Abstract a Few of the More Important of These Papers

CONCRETE VERSUS TIMBER FOR CONSTRUCTION OF PORT TERMINAL FACILITIES

By Frank White,

Chief Engineer, Board of State Harbor Commissioners, San Francisco

A VERY fine analysis of the factors which should govern construction at port terminals, showing how logical it is that wood should have been the universal building material for North American terminals, but also how changing local conditions have frequently compelled the port engineers of America to seek a more permanent construction.

Various methods of protecting timber construction and piles are discussed. It is shown that during the years 1909 to 1915, 23,000 creosoted piles were used in constructing new piers at San Francisco. By 1922, 343 of these piles had to be replaced and 4100 had to be repaired between high and low tide. In every case the damage was due to Limnoria attack effected through abrasions in the creosoted shell. The necessity of protecting timber floors is stressed, it being advisable to have all timber construction on the floor creosoted. In San Francisco practice has been for some years to cover plank decks with a bituminous wearing surface.

Mass concrete has been in use for sixty years in Europe and fifty years in New York harbor. Reinforced concrete structure in port terminals was first used in England about thirty years ago and in the United States about twenty years ago. In bulkhead wharves reinforced concrete slabs or sheet piles properly anchored have been found entirely practical. The oldest existing concrete bulkhead in San Francisco was built thirty years ago for the foundations of the Ferry Building. Plain concrete was poured inside of tight cofferdams of concrete piers resting on girders of piles below the mud line and carrying a series of groined arches forming the first floor of the building. Both the wharves and foundation are in excellent condition and there is every reason to believe that they will last indefinitely. (It will be noted that this construction went through the earthquake in 1906.)

San Francisco experience with reinforced concrete jackets for protection of wooden piles shows that with proper care in installation this type of construction will last over long periods. A number of important constructions have been built in this type since 1908. So far not a pile has been removed and the diver's examination indicates that they are all in excellent condition. More than 10,000 reinforced concrete piles have been used in the wharf construction in San Francisco harbor since 1908, with no replacements to date.

The concrete cylinder type of construction has also given satisfactory results. Since 1910 all of the structures having bulkheads at San Francisco have been built with reinforced concrete decks throughout of standard girder beam and slab design. Some cracking has developed in the beams and girders of these deck systems, but no cracking has taken place in deck slabs. All exposed concrete surfaces above the water line are painted with a heavy coat of hot asphalt to prevent penetration of moisture.

Figures are given of various types of construction on a single pier 100 feet wide designed for a live loading of 500 pounds per square foot. These figures show that concrete cylinder and reinforced concrete deck construction will cost approximately three times as much as creosoted pile and treated timber deck construction. The additional cost, however, is offset by greater length of life and less cost of maintenance in concrete piers. The fire hazard in concrete structure is distinctly less and the use of concrete substructure beneath the building permits of fire proof superstructure. It also gives a more sanitary and vermin proof structure than does timber. It frequently happens that the combination of the two materials makes the best structure for a particular location and use.

MODERN MECHANICAL HANDLING EQUIPMENT FOR PORT TERMINALS

By George W. Osgood,

Chief Engineer and Manager, Port of Tacoma

HIGH cost of labor with no prospect in sight of lower costs makes rapid turnover of cargo an important factor for the ship, for the dock operator, and for the shipper.

Two distinct problems present themselves in the selection of handling equipment—one the bulk cargo, the other the general or mixed cargo. The purpose of this paper is to deal only with the second problem.

In the handling of lumber, steel, and other open storage products the hammer type of crane is recommended. Three of these are in use at Tacoma, each of five tons capacity at 90-foot radius. Each of these cranes can handle from thirty-five to one hundred thousand feet of lumber per hour. The cranes are located on the dock, given an overhang of 36 feet from the dock face, and one crane can keep four hatches busy loading lumber. Grays Harbor has also installed two hammer cranes with 95-foot beam, and the Long-Bell Lumber Company has installed one with an 100-foot beam.

There is great variety of modern equipment in use for handling general cargo in transit shed and warehouse structures. At Tacoma they have found the straight line type of semi-portal dock crane with free revolving beam to be very successful device for handling general cargo. They are used in conjunction with a monorail system through the transit shed, the electric telphers on the monorail having three tons capacity and a travel speed of 800

feet per minute. With the system on a three-day test in the operation of handling general cargo with mixed marks from ship hold to place of rest in the transit shed, with cargo sorted as to marks and stacked, the best record has been one ton per hatch every minute and a half. Delivering sling loads from one to three tons from scow to shed the average time consumed being .7 of a minute per sling load.

Attention is directed to the portable telescopic conveyor now being constructed by the Port of Seattle, which takes cargo from the ship's hold and delivers in the shed as a continuous operation.

Sheerlegs or stiffleg derricks handling large weights, tractors, and trailors for distribution and transportation on the dock, stacking machines for verticle stowage, portable belt conveyors for lateral and vertical transportation, distribution, storing, and sorting are all useful adjuncts to the modern terminal. Handling gear, such as platforms, slings and burtoning arrangements should receive more study than is being given to it. Board slings are now usually preferable to net slings.

Stevedores and employes on the docks should be given education in the use of special machinery and it has been found in Tacoma that the men show a fine spirit of cooperation and a helpful reaction toward such methods.

In closing, the author pays tribute to an ancient yet modern, always indispensible piece of cargo handling machinery—"the little old two-wheel hand truck."

THE FUTURE OF PACIFIC COAST PORTS FOR GRAIN EXPORTS

By Col. G. H. Kirkpatrick,
President, Vancouver Harbor Commissioners

THIS paper traces the history of grain exports from Pacific Coast ports from the time when California, forty or fifty years ago, was a large exporter of wheat, down to the present, when the export business in the majority of grains has moved to the northwest ports and is carried on with a volume and through methods that certainly would be a revelation to the exporters of those old days if they could be here to take note.

The first shipment of grain from Portland, Oregon, took place about the year 1869; the first export shipment from Puget Sound about 1880. The movement thus begun increased normally and gradually until about 1900 there were over 100 grain ships sailing from Puget Sound in the export trade. About 1906 the construction of the Spokane-Portland Railway changed the situation, so that Portland, so far as grain shipments are concerned, was now on a successful competitive basis with Puget Sound ports, and in recent years has captured the bulk of the wheat trade for United States ports.

From 1906 to 1911 the average export shipment from Puget Sound and Columbia River ports was 33,000,000 bushels of wheat a year. This remained practically stationary until about the end of the five-year period beginning 1916 and ending 1921. Then in 1921 there was a great jump up to 68,000,000 bushels, which fell off again in 1922 and came back to 71,000,000 bushels in 1923-1924.

Prior to 1915 all grain was handled in sacks and, of course, sent around the Horn for European shipments.

It is interesting to note that one of the earliest shipments, 30,000 bushels, around the Horn from Vancouver netted a profit to the shipper of $12,000 due to the rise in the price of wheat during the long voyage.

Bulk handling was started in 1915 with an elevator built in Seattle. In 1916 another elevator was built in Vancouver; and subsequently elevators were built in Portland and Astoria. These elevators were not much used, however, until after the war on account of the upset condition of traffic through the Panama Canal during the war years. The growth of wheat exports under bulk handling is very strikingly illustrated by the Vancouver figures. In the crop year of 1920-1921, 572,000 bushels were handled for export; in the season 1923-1924, 53,000,000 bushels.

The paper points out the difference in situation in the United States and Canada. Exports of wheat and flour from the United States are steadily decreasing, the increase in population being greater than the increase in production. In Canada the increase in population is not nearly so rapid and there is a very large area of productive grain land not yet under cultivation. So that the Canadian figures for export of grain and flour were steadily creeping closer to those of the United States and last year considerably exceeded United States' figures.

The main markets are Europe and the Orient. Europe with fifteen wheat importing countries demands this year 720,000,000 bushels. The Orient, in wheat and flour, took last year approximately 62,000,000 bushels, 20,000,000 from Canada and 42,000,000 from the United States.

The typography of the North American continent with its backbone range, the Rocky Mountains, shows a trend to push the prairie wheat lands further east as the mountains trend south. Thus we have a distance of 640 miles separating the Calgary wheat fields in Canada from the Pacific ports. This increases to a thousand miles at Billings, Montana, and to 1250 miles at Cheyenne, Wyoming, so that the central fields of the United States are tributary to the east coast, the Lakes, and the Gulf rather than to the Pacific. The wheat lands of Idaho, Oregon, Washington, and California are tributary to the Pacific Coast of the United States. A considerable amount of wheat is grown at the present time in all of these states and there is much room for expansion in the yield. In Canada there is no exportable wheat grown in British Columbia, and the prairie wheat fields in Manitoba, Saskatchewan, and Alberta are the only available sources of supply for export through the Pacific ports of Canada. Until recently this wheat all moved through the Lake ports of Fort William and Port Arthur.

A study of the rates show that at the present time Calgary or Edmonton can ship to the United Kingdom via Vancouver at a rate slightly under that from those points to the United Kingdom via Montreal, while practically all of the other points in the wheat belt east of Calgary and Edmonton take a lower rate via Montreal than via Vancouver. These rates, however, are summer rates, and the bulk of the crop moves in the fall, and as it begins to move on account of the closing up of navigation in the Lakes the dividing lines moves rapidly eastward, so that Vancouver has an excellent opportunity, through proper traffic solicitation, to get the bulk of the western grain crop for export.

It is figured that there are some 47,000,000 acres tributary wholely or in part to the Pacific Coast. The entire wheat crop of the United States in 1923 was grown on 58,000,000 acres and that of Canada on 22,500,000 acres, so that the possibilities of export of grain from Puget Sound and Columbia River ports seem to be practically without limit.

UNIFICATION OF PORT TERMINAL RAILWAY FACILITIES

By Chas. T. Leeds,
Harbor Commissioner, Port of Los Angeles

THIS paper makes an excellent analysis of the relation of the railroad to the port and assumes a hypothetical case where one or more railroads already have vested terminal interests at the port, but where the city has already constructed certain stretches of belt railroad serving portions of the waterfront. There are three broad plans which may be offered as solutions of the problem. These are briefly as follows:

Plan No. 1. Continued operation of individual and independent trackage by each of the railroads and the city with interline connection constructed by them individually as they each may deem necessary or expedient.

Plan No. 2. Continued operation of individual and independent trackage by each of the railroads, but with connecting and continuous belt and marginal railway trackage constructed and operated by either the city, an independent company, or by an association of all the railroads and the city.

Plan No. 3. Complete unification of operating control of all trackage in the port district, under lease or direct ownership by either the city, an independent company, or an association of all the railroads and the city.

The paper then goes on to analyze these three possible basic plans and their probable effect on the general public, the shippers, and the railroads, and concludes that from all possible angles Plan No. 3 is the most practicable and best serves the interests of all concerned.

Having reached a conclusion as to plan, the author then goes on to analyze the problem of an operating agency for the plan and here again gives us an outline of three such agencies: first, terminal association; second, independent terminal company; and, third, municipal operation; and concludes on analysis that the first of these is the best agency for all concerned, although municipal operation, while it has many marked disadvantages, is cited as being advantageous in allowing the city to effect a complete absorption of terminal charges "which would operate as a strong factor in drawing business through the port." He then shows that regardless of the agency chosen assimilation of such of the existing railroad facilities as should properly become a part of a general transportation plan could proceed through on lease hold or the ownership plan, and concludes that the lease hold plan would prove preferable.

Reference is made to a physical plan and layout contemplating the complete unification of all railroads serving the Port of Los Angeles.

Port Improvement Notes

Allotments for river and harbor improvements under the act of Congress approved June 7 include the following:

In California: San Francisco harbor, $300,000; Oakland harbor, $245,000; San Pablo Bay and Mare Island Strait, $200,000; Suisun Bay channel, $13,000; Petaluma Creek, $37,000; San Rafael Creek, $30,000; Crescent City harbor, $45,000.

In Oregon: Coos Bay, $66,300; Yaquima Bay and harbor, $21,000; Willamette River above Portland and Yamhill River, $18,900; Columbia River and tributaries above Celilo Falls to the mouth of the Snake River in Oregon and Washington, $4000; Columbia and lower Willamette River below Vancouver, Wn., and Portland, $637,000.

In Washington: Grays Harbor and bar entrance, $81,000; Grays Harbor between Aberdeen and Chehalis River, $1000; Seattle harbor, $25,000.

In Hawaii: Honolulu harbor, $300,000; Kahului harbor, $1400.

Ports of Washington

Seattle Port Commission has just issued a very attractive and interesting year book. The book is illustrated with a number of beautiful plates of the harbor facilities of Seattle and the principal commodities and industries furnishing cargoes for the seaborne commerce of the port, as well as views of the city itself and the scenic beauties of the surrounding country. A digest of the commerce of Seattle and port statistics are also included in this book, which is one of the most interesting of its kind we have seen.

Kelso. For some time engineers have been investigating the best site for the establishment of port facilities for Kelso. Two channels have been suggested for development, Oregon Way and Carrollton Channel, and the Army Engineers of the Portland district are now making an examination of the upper Carrollton Channel. The establishment of port facilities at Kelso will open up a large timber section to cheaper transportation.

Grays Harbor is sending H. M. Delanty of the Grays Harbor Stevedore Company to Washington, D. C., to confer with Secretary of Commerce Herbert D. Hoover concerning the allocation of more navigation aids at this port. Other port commissions located on Grays Harbor will also send delegates to be present at a conference on the port's needs in advance of adoption of the budget for the Lighthouse Department.

Ports of Oregon

Astoria. The six months ending June 30, 1924, were the most successful in the history of the port of Astoria so far as the net returns from the port operations were concerned. The result showed that aside from the interest on the bonded to $209,894.10, while the operated indebtedness, repairs, and installation of new equipment, the port is more than self-supporting. In the period from January 1 to June 30 of this year, the operating revenues received by the port amounted to $209,804.10, while the operating expenses were $162,987.40, leaving the net revenue $26,906.70.

Portland. The Union Pacific System has entered into an arrangement with the McCormick Steamship Company whereby the latter has purchased the steamer Rose City, which was heretofore operated between San Francisco and Portland by the San Francisco & Portland Steamship Company, a subsidiary of the Union Pacific System. In addition to the purchase of the Rose City the McCormick interests have taken a long lease on the Ainsworth Dock property at Portland. The Union Pacific System is to improve this dock property by the construction of a large railroad and steamship terminal, which will be used jointly by the McCormick Steamship Company and the Union Pacific System. The first unit of the dock, to be constructed immediately, will include 1000 feet of covered shed, foundation and superstructure costing approximately $500,000. A double set of tracks will be placed on the front of the dock and a double set of depressed tracks at the rear. Electric freight elevators and modern fire protection, including an automatic sprinkler system, are provided for in the specifications.

(Continued from page 519)

nent timbering operations, have a combined length in the western states well above 5000 miles. The sawmill itself has developed into one of the world's finest combinations of specialized semi-automatic machines and handling devices, on a scale so stupendous as to fairly stagger the imagination.

Movements of the Industry

The lumber industry in the United States centered at first in New England, moved to the Great Lakes, then to the Southern States, and now is fast moving to the last great stand on the Pacific Coast. The graphical illustrations show the chronology and the volume of this movement. With this growth in the lumber operations has come a corresponding growth in sea shipments. We have seen how the first sawmill immediately opened up an export trade with Honolulu and from that first effort there has been a steady, gradually increasing growth of coastwise and offshore cargoes. Since the opening of the Panama Canal there has been also a great growth in intercoastal carriage of lumber.

It is our purpose in future articles to tell the stories of—

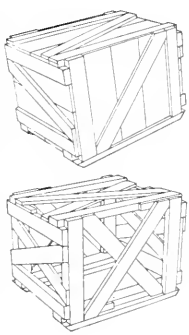
The Coastwise Lumber Carriers and the Development of the Lumber Schooner;

The Offshore Lumber Trade and the Place it Holds in Furnishing Cargoes for Pacific Ocean Vessels;

The Intercoastal Lumber Business and Its Relation to the Development of the American Merchant Marine.

Export Notes

A MANUFACTURER of gas engines, having had difficulties with export shipments, at the suggestion of the Transportation Division of the Department of Commerce, communicated with the Forest Products Laboratory of Madison, Wisconsin. The laboratory made a study of his problem and designed the crates shown in the illustrations herewith. These crates, according to the exporter, have stood every test and can safely be recommended as the best type of crate construction.



Attention is called to the "three-way-corner" construction; also to the diagonal braces, which give a rigidity to the crate that enables it to withstand the extra hazards encountered by export shipments. Detailed specifications of the crates, as furnished by the laboratory, follow:

These crates, constructed with what is known as the "three way corner" sheathed with nominal 1-inch lumber on the ends, sides, and top, and reinforced with a 1 by 4 inch diagonal brace on each of these five faces, is recommended for export shipments. It may possibly be found desirable to sheath the bottom of the crate and to reinforce it with a diagonal brace in the same manner as the other sides, although this is not usually necessary. The frame members of these crates are made nominal 2 by 4 inch stock, and are fastened with three 20-penny cement coated cooler nails at each end. The sheathing and diagonal braces are fastened with 1-penny cement-coated cooler nails spaced about 2 inches apart.

ELECTRICAL EXPORTS MAINTAIN STRENGTH

United States exports of electrical goods during May, 1924, totaled $7,206,587, according to preliminary figures, as compared with $5,349,568, for the same month of 1923, this gain being quite broadly distributed over the whole range of electrical classes.

Apparatus lines, especially transformers, showed a general gain over the like month of the year previous; in the case of the items named, the number of units did not increase greatly, but the average capacity and value per transformer were considerably above those for 1923. The stationary motor class is practically the only apparatus class in which there was any marked decrease, the biggest drop being in motors under one horsepower. Railway motors showed a good increase, but electric locomotives decreased.

Radio exports continued to increase and to that influence was possibly due some of the good increases shown in the shipments of batteries, both primary and secondary.

Wiring devices and miscellaneous supply lines all showed a fair increase, and insulated wire and cable exports were approximately 13 per cent above the figure for the same month of 1923.

On the whole, our foreign trade in electrical goods has continued the favorable trend which it has shown since the beginning of the year.—(Commerce Reports.)

ELECTRIFICATION OF JAPANESE RAILWAYS

WE note from report of Assistant Trade Commissioner Robert J. Phillips of Tokyo that the government of Japan will begin early in 1925 on the work of electrifying the Tokaido Railway Line between Tokyo and Akashi. The money has been appropriated for the work and details of the plans are being perfected.

The work under consideration will cost approximately 21,983,000 yen ($10,700,000), divided among the following items: Substations, 6,833,000 yen; overhead construction, 13,203,000 yen; communication equipment, 846,000 yen; train sheds, 1,101,000 yen. This does not include the cost of locomotives. Power will be purchased from private companies pending the completion of a hydroelectric plant with a capacity of 65,000 kilowatts. While foreign locomotives now dominate the field, at least one Japanese company is active in competing for this business and has had one locomotive in satisfactory trials.

The Bureau of Electrification announces plans are being made for the electrification of the Central and the Northern Lines.

OIL PURIFIERS AND BURNERS WANTED

A firm in Manila has requested catalogues and prices on oil purifiers of 5 to 10 gallons per hour capacity and on separators of 8 to 35 gallons per hour capacity. Complete information is wanted, including blue prints showing the method of installation, cuts or drawings, shipping weights properly boxed for export shipment, code words for placing orders, c. i. f. Manila prices on oil burners for 80, 100, 150, and 260 horsepower installations. B. & W. boilers with two 28-inch flues each are to be used. American manufacturers desiring to take advantage of this opportunity may forward printed matter to Assistant Trade Commissioner C. P. Goodhue, 510-512 Masonic Building, Manila, Philippine Islands.

With the Trans-Pacific Mails

(Continued from page 515)

sister ships of 3000 tons burden built of live oak, double-planked 4 inches thick, iron stripped. On her trial the Nebraska averaged 15 knots and is looked upon as the fastest ship on this coast."

The Nebraska opened the service from San Francisco on April 8, 1871. With many ups and downs it lasted till April, 1873, when the Nebraska made the last voyage of the big paddle boats across the Pacific.

The Mongol and Tartar were then chartered by H. H. Hall from the NewYork, London and China Steamship Company, vessels of 2000 tons register. Another ship, the MacGregor also joined in the service. The routes were from New Zealand to Kandavau, and from Sydney to Kandavau. As a rule the boats transshipped there to a vessel on the American run, but sometimes they ran right through. The Granada was the San Francisco-Honolulu-Fiji steamer.

Pacific Mail

After a time a joint service was run by the Pacific Mail Company and the Fairfield Shipbuilding Company of Glasgow, who had built two fine vessels, the Australia and Zealandia. The fleet running in this contract included the Vasco de Gama, Colima, City of San Francisco, City of New York, City of Sydney, Australia, and Zealandia. The City of Sydney is now trading as a six-masted schooner. The three "Cities" were built at Chester, Pennsylvania, in 1875 and were handsome vessels of 3000 tons with three masts and one funnel. The City of San Francisco on one occasion made the run from Auckland in 24 days, 12 hours, or 34 hours under contract time. The Zealandia and Australia were 2737 tons gross and 500 horsepower.

In 1877 the route through the Fijis was abandoned as it was held by the underwriters to be unsafe for night running. Honolulu became the only port of call.

Mail Contracts

The Pacific Mail Company's mail contract expired in 1885 and the company did not seek renewal. A contract was made jointly with the Oceanic Company of America and the Union Steamship Company of New Zealand. The Oceanic boats were the Alameda and Mariposa, built in 1884 of 3158 tons and 3000 indicated horsepower. The Union boat was the Mararoa, 2598 tons, 3500 horsepower. The Mararoa's officers were entertained at San Francisco and her engineers were presented by the American Society of Marine Engineers with three brass eagles to be fitted on each of the Mararoa's tailrods, as she was the first triple-expansion steamer to enter the Pacific. After one or two runs the Mararoa's mail room was found to be too small. She was withdrawn and the old Zealandia took her place, under charter, till the arrival of the Monowai, a new ship, specially built by the Union Company for the trade. The Monowai was later replaced by the Moana and the joint service continued till 1900. In that year Hawaii was formally taken over by the United States, which had passed legislation debarring any but American ships from trading between two American ports. This put the Union steamers out of court, and Spreckels' Oceanic line took over the entire service, the Alameda and Mariposa being replaced by the Sonoma, Sierra, and Ventura, with which ships a three-weekly service to New Zealand and Australia was maintained till 1907.

From that year until 1909, there was no regular San Francisco-New Zealand service. Then the Union Company began a service which connected at Tahiti with the Mariposa, while the Oceanic Company resumed running to Sydney with the Sonoma and Ventura, cutting out New Zealand. The Union Line now runs a monthly service via Tahiti, Raratonga and New Zealand with the steamers Tahiti and Maunganui. The Spreckels' service to Sydney has become a three-weekly one, the Sonoma, Ventura, and Sierra having been thoroughly reconditioned and retained in that service, which runs to Sydney, via Honolulu and Pago Pago.

The establishment of the All Red route via Canada in 1893 added another line of communication between the north and south Pacific. The opening of the Panama Canal also brought many lines of steamers from the Cape and Horn routes across the Pacific.

Yet the San Francisco mail route to New Zealand and Australia still holds its own, and it is richer in history than any other route leading from the Pacific Coast to Australia.

Book Reviews

The Pirates Own Book, or authentic narratives of the lives, exploits, and executions of the most celebrated sea robbers. Small octavo, 486 pages, 78 illustrations, black linen binding with red stampings; published by the Marine Research Society, Salem, Massachusetts; price $3.50.

The Pirates Own Book was first published in 1837. The original edition proved to be so popular that nearly every copy has been worn to shreds by constant reading, and original copies are now practically unobtainable. The average reader of today will find this book a virgin field. Very few of the larger libraries possess a copy and even the Library of Congress had only the 1859 edition. The Marine Research Society is now issuing a new edition as its fourth publication.

The Pirates Own Book preserves an account of the deeds of the great pirate captains of the seventeenth and eighteenth centuries and also describes the early Normand pirates, the Algerines, the Malay and Chinese freebooters of the sea, and in considerable detail the work of the Spanish pirates in the West Indies. In fact, it is a general account of piracy in all parts of the world.

* * *

The Life of the Ancient East, by James Baikie, F. R. A. S.; 400 pages, profusely illustrated; published by the MacMillan Company, New York; price $4.

This volume by James Baikie gives some chapters of the romance of modern excavations and reconstructs out of the findings of the explorers the lives of the various nations which inhabited the Eastern Mediterranean, the Nile Valley, Asia, and Mesopotamia. The book includes all of the more important discoveries of modern times down to and including the tomb of King Tutankhamen with its intensely interesting remains of ancient Egyptian history. Of big interest in this book to students of ancient marine law and customs is the chapter on Knossos, the home of the sea kings of Crete, whose galleys held control for centuries over the Eastern Mediterranean.

LUBRICATION ON SHIPBOARD

An Open Forum—Questions on Lubrication Problems are Invited; They will be Answered in Order of Receipt

INSTALLMENT No. 4

This page, Lubrication on Shipboard, is attracting favorable mention of many of our readers, and as will be observed a number of practical questions are being sent in for solution. In this installment we have the solution for groans on shipboard, the best methods of cutting grooves in bearings, some suggestions for the removal and prevention of carbon in diesel engine cylinders, a definition of the term "fixed oils," and directions for the proper lubrication of gearing in deck machinery.

Question No. 22.—What does groaning in the cylinders indicate? We have a boiler feed pump that groans continuously in spite of the oil we feed to it. The other pump never groans, also our high pressure valve will run along for days without trouble and then start to groan, but will quit after a while without any apparent reason.

Answer.—The primary reason for groaning in steam cylinders is the lack of proper lubrication, or, in other words, a metal to metal friction. Under a microscope, metal surfaces such as cylinder walls and piston rings present a rough serrated surface resembling hills and valleys. These surfaces interlock upon being passed over each other and cause metal friction. The introduction of an oil film, which tends to keep the surfaces apart, means the elimination of metallic friction and spells lubrication.

The probable reason for one of your feed pumps groaning and the other running quiet is because one pump has a tight piston. You can check up on this with your feelers for clearances. Oftimes if you knock off the sharp edge on your piston ring with a fine file it will help a lot.

Probably you are using a straight mineral oil for your cylinder lubrication. Most likely this oil is the same as you are using for swabbing piston rods. If you will pour a little of this oil in your hand and add some water and stir vigorously, you will discover that the oil and water will not mix. This will demonstrate that it is a straight mineral, whereas if a smooth, soapy consistency is the result, it will prove that the oil is compounded. Most cylinder oils sold to the marine trade are straight mineral, as the general opinion is that oil to be used around superheat steam and on piston rods must be of this character, but contrary to the general belief a compounded steam cylinder oil is more efficient.

Your feed pumps are on the auxiliary pressure line which carries about 135 pounds. This means wet steam, and a small amount of compounded steam cylinder oil will do more than many times its volume of straight mineral.

In regard to your high pressure valve, the explanation of this is that once in a while you will get a shot of water through the throttle, and this washes the oil film off the metallic surfaces and allows metal to metal friction to be set up. After operating a while, the oil film is automatically restored and the noise ceases.

The use of much cylinder oil aboard ship is of course to be avoided, but there are times when a good cylinder oil is absolutely necessary, and, as before stated, an oil with about 5 per cent of good acidless tallow oil will be found to give the best results.

Question No. 23.—What is the proper way to cut the grooves in main bearings and on connecting rod brasses top and bottom ends?

Answer.—There are as many theories regarding the shape and arrangement of oil grooves as there are engineers and manufacturers. No set hard and fast rules govern this practice, but the oil grooves are meant to distribute the oil from the point of delivery, and under no circumstances should oil grooves conduct the oil to the side of the bearings and allow it to escape. Oil grooves should be shallow and must be examined frequently to prevent plugging up. Poor babbitt metal and faulty oil distribution are often the cause of trouble which is unjustly blamed on the lubricating oil.

Question No. 24.—In our diesel engines the deposit of carbon is very heavy. Just what do these deposits consist of and how can we prevent their formation?

Answer.—The formation of carbon in your engines may be due to several causes. Fuel oils are the source of the carbonaceous matter, for which the lubricating oils receive the blame. When fuel oils contain too much free carbon and ash, the unburnt impurities will deposit themselves on the cylinder surfaces. This will adhere to the lubricating oil and form a deposit causing heavy wear of cylinder walls and piston rings.

Sea water spray held in suspense and drawn down through the engine room ventilators has the effect of producing salt deposits and causes iron rust to manifest itself.

Chemical contents of carbon can only be ascertained by laboratory analysis. All lubricating oils form deposits in a greater or lesser amount according to the character of the lubricant. Lubricating oils made from naphthenic and asphaltic base crudes have proved to be better oils for the lubrication of internal combustion cylinders than the paraffine base oils, which are more inclined to "crack" and form carbon. Pale colored, low setting point, non-paraffine base oils have been adopted by the United States Navy for the lubrication of submarine and aircraft machinery and various other internal combustion equipment. Straight paraffine base oils have high setting points and produce hard, brittle carbon, which requires a cold chisel for removal, while the naphthenic base oils produce a soft soot, practically all of which blows out the exhaust pipe and what remains behind can be wiped off with a cloth. Such deposits cause no trouble.

Question No. 25.—What are fixed oils? Please name off a few and what are these oils used for.

Answer.—Fixed oil is the name covering vegetable and animal oils. Fixed oils contain as much as 12 per cent oxygen and have a tendency to combine rapidly with oxygen and become gummy and hard. Fixed oils are divided into quick drying and semi-drying oils. Animal oils are extracted by heat from fatty animal tissues, this process being called rendering and in this manner we obtain tallow, lard, sperm, fish oil, neat's foot, etc. Vegetable oils are pressed out by hydraulic pressure or extracted chemically. Such oils as cotton seed, rape seed, peanut, linseed, olive, and castor oil are obtained in this manner.

Both animal and vegetable oils are used in compounding mineral oils for various purposes. Good steam cylinder oils are heavy [illegible] cylinder stocks compounded with from 5 to 15 per cent of good acidless tallow oil or lard. Marine engine oils for crosheads, pins, guides, thrust blocks, etc., contain up to 20 per cent of rape seed oil, which will saponify in the presence of water. Thread cutting oils are composed of tallow and lard or mineral and fish oils combined. Sperm oil is [illegible] and lard oil.

Fixed oils are seldom used straight with the possible exception of rape seed oil which is used on slow heavy journals [illegible] portion of aircraft engines.

Question No. 25.—What is the proper lubrication for large [illegible] machinery?

Answer.—[illegible]

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

THE WORLD'S LARGEST OAKUM FACTORY

AN unfailing supply of proper caulking material is a matter of vital importance to the vast number of people who make their living on ocean, lake, or river.

Away back in the dim ages when man first started to build ships of planks held together by ribs, the caulking materials used were necessarily very crude and consisted principally of pitch and other gummy substances. This caulking, however, was unsatisfactory, as it would harden and crack if exposed to cold or it would melt if exposed to heat, and therefore required almost constant attention.

The plant of the G. Stratford Oakum Company at Jersey City, N. J.

The oakum of the present day is the result of centuries of gradual improvement both in the selection of raw materials and method of manufacture.

Manufacturers of oakum in the United States are dependent upon the importation of fresh raw materials from Russia, India, and Italy. The hemps of these countries are also employed for making most of the cordage used in all of the European countries, and, when this cordage becomes too weak to stand the strain of its normal work with a certain degree of safety, it must necessarily be discarded and then becomes oakum rope, a raw material for the oakum manufacturer. Most of this material finds its way to the oakum mills of the United States.

Marine oakum is used for all forms of caulking work, such as sides, bottoms, and decks of wooden vessels, decks of steel and iron vessels, cassions and floors. In the general trade there are three grades of unspun oakum and three grades of spun oakum.

Good caulking oakum must be of such quality that when caulked into a seam it retains a certain amount of elasticity, so that when a seam expands or contracts, the oakum also expands or contracts correspondingly, and the seam remains always tight.

Oakum to be good for marine caulking should be made entirely of soft fibre hemps which have been thoroughly teased out and carded, the fibres remaining of a sufficient length and strength to make a good thread when spun either by hand or machinery.

Before going through the carding, spinning, or finishing machines, these fibres must be thoroughly impregnated with a superior quality of pine tar. They must contain and retain sufficient tar to make them impervious to water, but not so much as to cause them to become saturated and soggy, since tar, of itself, does not make a good caulking material.

Nearly three-quarters of a century have passed since George Stratford entered the oakum business, and from a small begining the George Stratford Oakum Company has grown to be the largest producer of oakum in the world.

The company's main factory is located in Jersey City and has a capacity of over twenty-five tons of oakum per day. A branch factory located at Cobalt, Connecticut, has a capacity of five tons per day. The Cobalt plant was established in 1828 by the Tibballs Oakum Company and was absorbed by the Stratford Company in 1911. The company will therefore be entitled to the distinction of the "century old" class in 1928.

Owing to the fact that the manufacture of oakum is a specialized industry of relatively small volume as an industry, it has never been feasible to develop standard machinery which could be used by the trade generally as is the case in many other lines, where the total volume of production is larger. Consequently, the Stratford plant has been developed by its proprietors from their own experience, with the result that many of the machines and processes employed are not formed in any other oakum factory.

The present officers of the company are as follows: Arthur C. Stratford, president; William C. Stratford, vice-president; Frank B. Stratford, treasurer; Morgan Decker, secretary.

Stratford oakum is rated as first class by the American Bureau of Shipping and by Lloyd's Register of Shipping, and in addition to enjoying a very large sale throughout the United States and Canada, regular shipments are made to the principal seaports in all parts of the world.

The company has published a very interesting book of useful information regarding Oakum and kindred products. This book has been printed in English, Spanish, French, and Portuguese and will be sent free on request to all who are interested.

OLD BOATS MADE NEW

A GOOD old homely proverb declares that "the proof of the pudding is the eating."

L. W. Ferdinand & Company, Boston, Massachusetts, have for years specialized in the distribution of Jeffery's marine glue. They are therefore gratified to have recently received the following unqualified endorsement of their product and methods:

"In regard to your method of 'Making Boats Leakproof' I am more than pleased to advise you that I had a boat that all my friends said was no good except for firewood. I made it leakproof with unbleached cotton laid in your Jeffery's No. 7 black soft quality marine glue according to the directions in your white booklet and I now have a boat practically as good as new and that will last for years.—H. A. Dalrymple, 29 Rutherford Ave., Haverhill, Massachusetts."

IMPROVEMENT IN BOILER PERFORMANCE

THE illustrations on this page show in a graphic way the remarkable results obtained by the scientific application of Celite products to the insulation of the shells of the watertube boilers on the "President" class liners of the United States Shipping Board operated out of San Francisco by the Pacific Mail Steamship Company.

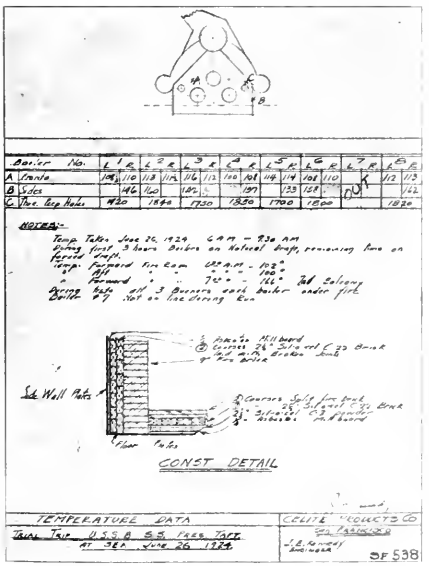
In the two diagrams are shown the construction details indicating the manner in which two courses of Sil-O-Cel brick are laid to staggered joints against a $\frac{1}{4}$-inch asbestos mill board contacting the side wall plates, and inside of these a course of 9-inch fire brick. The floor plates are covered with $\frac{1}{4}$-inch asbestos mill board on which is laid a $2\frac{1}{2}$-inch layer of Sil-O-Cel C-3 powder, above which is applied one course of the Sil-O-Cel brick, and this in turn is covered with two courses of split fire brick with staggered joints.

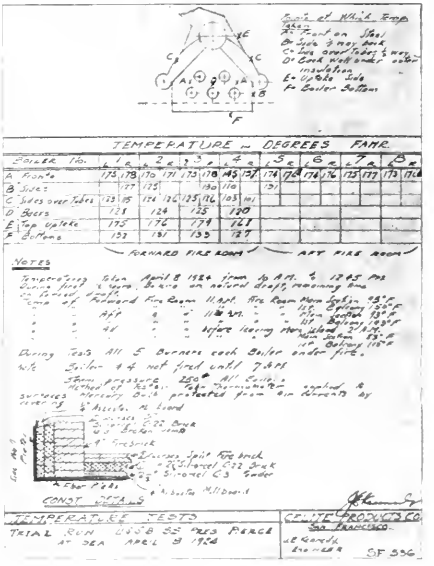
It will be noted that with temperatures of 1850 degrees Fahrenheit, at the peep holes the temperatures on the sides and the front outside plates in no case ran above 180 degrees. In other words, no housewife could have boiled water on the outside of these big stoves with all their powerful oil burners going full blast.

Undoubtedly the splendid insulating qualities of Celite products are responsible for a considerable share of the improvement in fuel economy which has been so amply demonstrated in these boilers since their reconstruction, and it is obvious that this improvement will also show very markedly in the maintenance cost.

Insulation, such as is shown by these tests, will entirely eliminate buckled plates and will so minimize expansion and contraction in the frames of these boilers as to have a very marked influence on the upkeep of the tubes themselves.

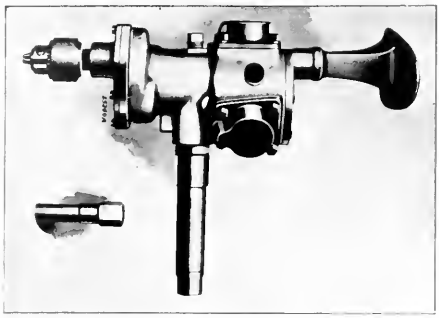
Above is shown the interior of one of the Babcock & Wilcox watertube boilers on the U. S. S. B. S. S. President Wilson with insulation partially complete, showing method of laying Sil-O-Cel powder and Sil-O-Cel brick on the furnace floor. Below is shown test data from the sea trials of the S. S. President Taft and the S. S. President Pierce.





New Size Pneumatic Drill

A NEW size light weight non-reversible pneumatic drill has been brought out by the Ingersoll-Rand Company, 11 Broadway, New York. This new drill is known as Size D and is suitable for light drilling up to 9/16-inch diameter holes, and reaming up to 5/16-inch diameter.



A new size D pneumatic drill recently developed by the Ingersoll-Rand Company.

This is a light weight drill which may be fitted with either breast-plate, feed screw, or grip handle and so made adaptable for a wide variety of work. The construction of this machine is very similar to that of the No. 6 and 600 drills, which this company brought out some two years ago and which were powered for drilling up to $\frac{3}{8}$-inch diameter. These drills proved so successful that this new size D drill of larger bore and stroke was developed.

The features of this type of machine are briefly—light-weight aluminum case, with steel bushings cast in all the bearing holes and the throttle hole; cast iron cylinders which are renewable and interchangeable, and special three cylinder motor. The renewable cylinders are a valuable feature, as any cylinder after long service, may easily be replaced and the motor made as good as new at slight cost.

The three cylinder motor has the rotating parts all accurately balanced, eliminating vibration and reducing wear and tear on the machine. The drill is very economical in air consumption and cost of maintenance, is high powered, and, moreover, exery part is readily accessible for inspection.

The details of the Size D drill are as follows:

Recommended working speed at 90 pounds air pressure, 700 R. P. M.

Weight (including breast plate and chuck), 14 pounds.

Length of feed (with feed screw), $2\frac{1}{2}$ inches.

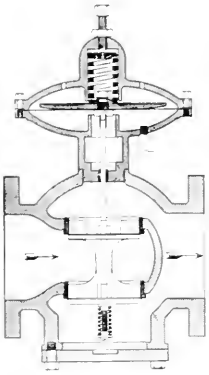
Standard twist drill will drive, 9/16 inches.

Size reamer will drive, 5/16 inches.

Length over-all (with breast plate and chuck), 15 inches.

Distance from side to center of spindle, $1\frac{1}{2}$ inches.

Size hose recommended, $\frac{1}{2}$-inch.



Sectional elevation of the Witt pressure reducing valve.

WITT PRESSURE REGULATORS

WITH the increased demand in modern engineering practice for high steam, air, and hydraulic pressures, there has come the necessity for special devices to regulate and to reduce these pressures. Two types of such apparatus have been in use—those controlled by diaphragm and spring and those controlled by a weight through suitable levers. The former has always been the more practical type, and in that type the line of pressure regulating valves manufactured by G. E. Witt Company, Inc., of San Francisco has set a very high standard for over twenty years.

In principle the Witt pressure regulating valve consists of a double-seated balance valve and body on which is mounted a diaphragm chamber containing a diaphragm. The balance valve is connected by a stem to the diaphragm, the valve being held open by a spring which operates against the reduced pressure. The spring is adjustable. When the reduced pressure reaches the pre-determined pressure which the regulator is adjusted to carry, it raises the diaphragm and with it the valve, in this way regulating and maintaining a steady pressure on the reduced pressure line.

In practice these elements of the valve are constructed from the finest materials and with the most expert workmanship and finish.

The same principle of pressure regulation serves with equal efficiency as the basis for the design of a pressure governor for pumps and has an almost infinite variety of applications in the leading industries and in power plants afloat and ashore.

Several of the greatest oil companies, power companies, and heating plants in America have adopted Witt pressure regulating apparatus as standard, and many power installations abroad have used these San Francisco products extensively.

ANDERSON OIL ENGINES

THE Anderson oil engine, as described in catalog No. 12 of the Anderson Foundry & Machinery Company, Anderson, Indiana, operates on the valveless 2-cycle, medium compression, solid injection principle with crankcase compression for scavenging air and with a starting plug heated by a torch. Arrangement is made for a solid light load ignition plug, which assists to ignite lean mixtures on the light loads. Because of this construction the Anderson oil engine runs regularly on compressions of about 250 pounds. The light load plug feature is patented.

The Anderson type K engine is built with three sizes of cylinder—30, 45, and 55 horsepower. With these three cylinder sizes a large number of combinations can be made, including 2, 3, 4, and 6 cylinder engines ranging from 30 horsepower up to 325 horsepower.

(Section continued on page 544)

MARINE INSURANCE

DEVELOPMENTS OF THE MONTH

By CHARLES F. HOWELL, Contributing Editor

PERHAPS the most important constructive work in marine insurance this summer has been centered around an improvement in the wording of the familiar "warehouse to warehouse" clause by the Institute of London Underwriters. Reference was made, in this department last month, to the altered clause put forward by London as a substitute for the old, unsatisfactory form. The reception accorded the new wording, however, was so far from friendly that the Institute was forced to try its hand at it once more, and this time with better success.

The storm of protest that hailed the first draft came from all sides and was due to two objections; first, because of the use of the phrase "discharge . . . from the vessel," and, second, because of possible disputes respecting the indefiniteness of the allocation of responsibility for delay in the last sentence. It was pointed out that the use of the word "vessel" might be taken to mean any craft, lighter or barge, and that goods might be discharged from the steamer which had carried them, say from London to Yokohama, into barges or lighters and remain therein at Yokohama for a considerable period. In such a case, it was urged, it was clearly the intention of the clause to limit the period during which the risk continued to the stipulated period, commencing at midnight on the date on which discharge from the steamer was completed, but opportunity would be left for limitless arbitration and litigation in interpretation of the word "vessel" as well as the meaning of the phrase itself. In the last sentence, the phrase "held covered at a premium to be arranged" was felt to mean that no such premium would be claimed or due unless a claim under the policy arose, when it would be very difficult to establish the relevant dates from which the new premium should be paid, to say nothing of the possible difficulty in arriving at the rate itself.

It was also insisted that delay arising from circumstances "beyond the control of the assured", as stated in the clause, might give rise to endless disputes when delays due to strikes, possibly of the consignees' employes, customs delays, shortage of river or rail transport, developed, any or all of which might or might not be "beyond the control of the assured."

Altered Clause

In view of this wholesale criticism the Institute decided to rewrite the controversial clause, substituting the words "overseas vessel" for the former word "vessel", but declining to redraft the phrase

AN USEFUL BULLETIN

At the left we show a facsimile of the cover page of the "Ship's Bulletin" issued by the Marine Department of the Standard Oil Company of New Jersey. This bulletin serves a very useful purpose in keeping up the morale of the personnel of the Standard Oil Company's fleet, and is a very fine medium for educational purposes.

Perhaps one of its most useful functions is in carrying the message of "Safety First" to the officers of the fleet. The poster reproduced at the right is one of many which have appeared as full page inserts in the bulletin.

The management of the marine department of the Standard Oil Company deserve great credit for the work they are doing in carrying on afloat the message of industrial safety which is being made the subject of such extensive propaganda ashore. There is room in the American merchant marine for more of such bulletins.

in the last sentence in order to specify what cause of delay shall or shall not be considered to arise from circumstances "beyond the control of the assured."

The final draft of the clause reads as follows:

> The risks covered by this policy attach from the time the goods leave the shipper's or manufacturer's warehouse at the port of shipment, unless otherwise stated, and continue during the ordinary course of transit, including customary transshipment if any, until the goods are safely deposited in the consignee's or other warehouse at the destination named in the policy or until the expiry of fifteen days from midnight of the day on which the discharge of the goods hereby insured from the oversaes vessel is completed, whichever may first occur. When the destination to which the goods are insured is without the limit of the port of discharge of the overseas vessel the risks covered by this policy continue until the goods are safely deposited in the consignee's or other warehouse at the destination named in the policy or until the expiry of thirty days from midnight of the day on which the discharge of the goods hereby insured from the overseas vessel is completed, whichever may first occur. Transshipment if any, otherwise than as above, and or delay arising from circumstances beyond the control of the assured, held covered at a premium to be arranged.

New British Warranties

As a result of the strenuous objections made by the Canadian authorities to alleged discriminations against Canadian ports by British underwriters, a concession, as regards hulls, has been made in a revision of the London Institute warranties, 1924. The new warranties accord the privilege of loading cargo at Halifax, where only coal loadings were permitted before. It places Halifax on a parity with United States Atlantic ports. Cargo does not receive an improved consideration, although Canadian shippers have been loud in demanding it. Underwriters cannot forget the perils arising out of fogs and dangerous navigation conditions elsewhere on the Canadian Atlantic coast the greater part of the year.

The revised warranties read thus:

1. Warranted not to enter or sail from any port or place in British North America on the Atlantic Coast, its rivers or adjacent islands, except the port of Halifax, and for bunkering purposes only the ports of Louisburg and Sydney, or to enter or sail from any port or place north of 50 degrees north latitude on the Pacific Coast of America, its rivers or adjacent islands.

2. Warranted not to enter the Baltic beyond 13 degrees east longitude, or sail from a port therein between October 1 and April 1.

3. Warranted not to enter waters north of 70 degrees north latitude.

4. Warranted not to sail with Indian coal as cargo between March 1 and June 30.

5. Warranted not to sail for or from any port or place in the Bering Sea or Alaska or Siberia (except that vessels may enter or sail from Vladivostock between May 1 and November 1).

Norske Lloyd Claims Disallowed

Much interest is being taken in the report of the New York Insurance Department on Norske Lloyd American claims, $1,000,000 of which have been disallowed. The disallowance is based not upon the merits of the claims, but because they did not originate from the business of the company written through its United States branch. In the opinion of the New York Insurance superintendent, his duty extends only to the examination and allowance of claims arising from business transacted in the United States. Accordingly, he disallowed foreign claims amounting to $665,416.11, representing cases where the original liability was upon a foreign policy and the claimant is a foreigner. In addition, he has disallowed American claims amounting to $331,833.09.

Johnson & Higgins and several other marine brokers and direct insured retained Rumsey & Morgan, attorneys, to test this decision in our highest courts. Their contention is that the disallowed American claims consist of a large number of comparatively small items, making the expense of conducting such litigation by any one claimant practically prohibitive and cooperation advisable.

Extends Canadian Summer Season

In an interim report submitted to the Canadian government by the British Imperial Shipping Committee, an extension of the summer season in regard to marine insurance on hulls and machinery until October 31 is recommended, and the report has been accepted by Lloyd's underwriters and the London Institute of Underwriters. The effect of this report is to extend the summer season for insurance purposes from May 15 to October 31, instead of from May 1 to October 1. This means that the additional premium charged heretofore after October 1 is not to be charged until October 31. Although this concession at present applies only to hulls and machinery, it is believed that the same accommodation will eventually be extended to include cargo as well.

Underwriters agreed to the report on the assumption that all aids to navigation are not to be removed on the British North Atlantic before

October 31, and they desired the assurance of the Canadian government on this point.

Inland Freights Changed

The Canadian House of Commons has given approval to a bill amending the inland water freights law of last season which led to difficulties with American vessel owners on the Great Lakes. Under last year's legislation vessel owners were required to file their rates for grain with the Board of Grain Commissioners. American vessel owners refused to file their rates, however, and for some time declined to send their boats to Fort William and Port Arthur for grain. Under the new legislation the vessel owner will not have to file his rates, but the shipper will be required to file a copy of his contract or charter for the carriage of grain from the head of the lakes to any port in Canada or the United States.

New Cotton Season

On September 1 the new cotton season was ushered in. Preliminary information from dependable underwriting sources has been to the effect that rates and conditions would continue about the same as last season, but ugly rumors of impending rate reductions have been frequent of late. It is insisted that the demands of business for this output is satisfactory, particularly as regards heavy foreign buying orders, but that the recent government report showing less than 13,000,000 bales, taken in consideration with the continued severe drought in Texas which is opening the bolls prematurely and damaging the new crop, has had the effect of sharpening competition for what underwriting coverage is in sight. Rates on overseas shipments may, it is said, be cut from 20 to 25 per cent.

Greatest Salvage Feat

What is declared to be the most extraordinary piece of salvage work in the history of marine insurance has recently been brought to a successful completion off the north coast of Ireland. The steamship Laurentic, bound for America with a cargo of bar gold, was sunk by mines or torpedoes in 120 feet of water January 25, 1917. There were 3211 bars, and the valuation was $21,500,000. Salvage work on this treasure ship has been going on for seven years. Every one of the gold bars have been recovered, the last being brought to the surface during the closing days of August of this year. The wreck was taken apart, plate by plate, and ingenious devices employed to aid the divers. A special diving suit was invented, equipped with electric light and an air chamber regulated by the diver, and it is believed that with this device salvages will be possible at a depth of 1000 feet. A fire hose was used for loosening the mud which had settled in the wreck. It was, at first, a most discouraging operation, only fifty-two bars having been recovered during the first two years' work.

War Risk Claims

Underwriters have been taking the liveliest interest in the news from Washington with respect to the progress of the Mixed Claims Commission in determining final settlement of war risk claims against Germany. The proposed basis of settlement is that American private insurance companies should receive $39,156,000 for their out-of-pocket losses on hull and cargo claims. The Veterans' Bureau, formerly the War Risk Insurance Bureau, would receive $29,032,000 for its out-of-pocket losses. This covers losses arising under war risk insurance written on sailors, in addition to losses on war risk insurance written upon hulls and cargoes. These figures do not cover what are known as port of refuge cases. Thus, claims for loss incidental to putting into a port of refuge as a measure of safety are not included in the terms of settlement. For various reasons, the hull and cargo claims of some ten companies, amounting to $1,700,000, and the claims of admitted foreign companies are likewise not a part of the settlement. No action has been taken on life insurance companies' claims as yet.

"Carriage of Goods" Law

It is believed to be certain that the English House of Commons will soon pass the "Carriage of Goods by Sea" act, which has already been adopted by the House of Lords. This measure is based on the Hague Rules, revised by international conference a year ago, and it has been understood that all nations represented at the Brussells meeting would take action of this character in order to incorporate into their laws this splendid movement for a universal bill of lading.

Commenting upon the House of Lords' act a prominent British underwriting authority describes the value of the measure as follows:

"It will be of inestimable value to underwriters, since it fixes an irreducible minimum of liability out of which shipowners are forbidden to contract, and, therefore, gives a definite basis for the insurance of goods carried by sea. On broad lines it may be taken that those liabilities out of which shipowners may not contract are not to be included in a policy of marine insurance; while those out of which shipowners may contract may be, but not necessarily are, covered by insurance. It may be left to the technicians to decide what liabilities are, and what are not, to fall upon underwriters when the act becomes law."

It is the duty of the United States to pass a bill dealing with the same subject, for she was represented at the Brussells conference, where her agents endorsed the proposal. There ought to be as little delay as pos-

sible in getting an American bill of this kind on our statute books.

Fire Liability in Open Policies

Officials of fire insurance companies have been registering their complaints about the liability of cover under marine open policies. They insist that the rate charged by marine underwriters is "ridiculous", and that it has resulted in the fire insurers losing a large amount of warehouse business to the marine men. By way of warning they prophesy that such low tariffs are bound, sooner or later, to bring serious disaster to the marine underwriters.

Freights and Charters

September 16, 1924.

IN our last report dated August 14, parcel rates on wheat and barley from this coast to the United Kingdom and Continent were ruling at 27/6 to 30/- and very little volume moving even at these rates. During the later part of August the demand for space commenced to increase, rates advancing to 31/6 and then on to 35/- during the first part of this month for November-December shipment.

Chartering in full cargoes also commences to show activity, the Swedish steamer Arator having been fixed for wheat from the north Pacific to the United Kingdom or Conitnent at 32/-, Sept.; British stmr. Baron Lovat for Oct. at 31/3; Japanese stmr. Brazil Maru by Balfour, Guthrie & Co., Oct., 31 3; Japanese stmr. by Wilmer Grain Co., Oct.-Nov., terms private; Japanese stmr. by Balfour, Guthrie & Co., Oct.-Nov., terms private; Japanese stmr. Port Said Maru by Strauss & Co., Oct.-Nov., 30/-; British stmr. Bendoran by Kerr, Gifford & Co., terms private; Japanese stmr. by Canadian Grain Export Co., Oct.; Japanese stmr. by Strauss & Co., Nov., and five other Japanese steamers for Oct. and Nov. loading, all for wheat. The charterers and the rate have not been stated. British stmr. Orient City has been chartered for the same business by Balfour, Guthrie & Co. for Oct. at 31 9; Japanese stmr. Vancouver Maru by Bunge Western Grain Co. for Oct.

There have been no full cargo fixtures in barley as the movements in this commodity from San Francisco have been entirely by the regular liners.

The only activity in full cargo fixtures for lumber has been from the North Pacific to North of Hatteras, as follows: Norwegian stmr. Hanna Nielsen, by Southern Alberta Lumber Co., terms private; American stmr. El Abeto, $12.50 per thousand feet; American stmr. El Cedro, $12.50; American stmr. El Cicuta, $12.50; Japanese stmr. Rosan Maru, by A. C. Dutton Lumber Co., Oct., $12; Japanese stmr. Etna Maru, Southern Alberta Lumber Co., Sept., $12; Japanese stmr., by Krauss Brothers, Oct., $12; Japanese stmr. by H. R. MacMillan Export Co., $12; Japanese stmr. by Southern Alberta Lumber Co., Oct., $12; American stmr. Lydia to New York by C. K. West & Co., terms private; Japanese stmr. by Southern Alberta Lumber Co., Sept.-Oct., $12; two Japanese stmrs. by Krauss Brothers, Sept.-Oct., $12.25; Japanese stmr. by H. R. MacMillan Export Co., Sept.-Oct., $12; Japanese stmr. Taibu Maru by Southern Alberta Lumber Co., $12, Sept.; Japanese stmr. Yaye Maru, same charterers, Sept., $12; Japanese stmr. Yone Maru by Krauss Brothers, Oct., $12; Japanese stmr. Yuri Maru by H. R. MacMillan Export Co., Sept., $12.

In full cargo fixtures in lumber for Australia the fixtures have been very few, the Buyo Maru having been taken by J. J. Moore & Co., Sept.-Oct., terms private.

United States Shipping Board reports the sale of the concrete tank steamer Peralta to Peralto Portland Coment Co., terms private, as also the stmr. Hannawa to the Columbia Pacific Shipping Co., and the tanker Lio to the General Petroleum Corp.

With the exception of the activity in the grain movement for the United Kingdom and Continent, chartering in other commodities to foreign ports shows no improvement nor do reports from other parts of the world give any indication of improvement in the near future.

PAGE BROTHERS, Brokers.

SHIPBUILDING AND SHIP REPAIRING

New Motorship Launched

ON Tuesday, September 2, at the yard of Moore Dry Dock Company, Oakland, the motorship Port Costa, latest addition to the Associated Oil fleet, was launched. Little Dorothy Zeh, daughter of George Zeh, manager of the marine department, had the honor of christening the new petroleum carrier.

On the trial trip, which was run on San Francisco Bay on Wednesday, September 17, officials of the company who were present expressed themselves as being greatly pleased with the trim lines of the new craft and with the ease with which she was handled by her pilot.

Standing on the deck immediately over the engines of the twin screw propellers, one notices almost no vibration. The lines of the boat are such that she takes the swells easily and gracefully. The propelling machinery of the Port Costa consists of two Pacific-Werkspoor diesel engines of three cylinders and 110 horsepower each. The engines are located aft and are connected by direct drive to the twin screw propellers. The length of the boat is 140 feet between perpendiculars; molded breadth, 30 feet; and molded depth, 9 feet 6 inches. The speed will approximate 8 knots per hour. She will carry a crew of five, including the cook.

The captain of the new boat is Isak Carlsen, formerly captain of the Cycol. The first engineer will be Jack Thygeson, who was also formerly on the Cycol. Jim Cleghorn will be promoted from pilot to captain of the Cycol.

The Port Costa will be used to carry refined oil products from the Associated Oil refinuery at Avon to the wharves of the Associated distributing plants at San Francisco, Alameda, and Stockton.

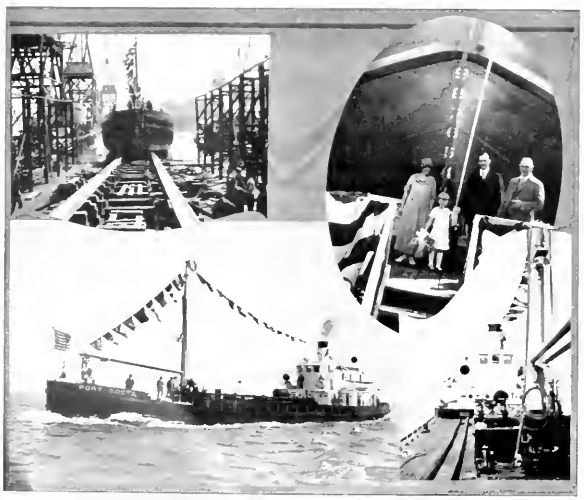
BETHLEHEM AWARD

An important shipbuilding development on the Pacific Coast during the past month was the award of a contract to the Bethlehem Shipbuilding Corporation, Union Plant, San Francisco, by the Standard Oil Company of California for a 10,000 barrel capacity diesel-electric oil tanker for inter-island service in Hawaii.

The new vessel will be almost identical in construction and equipment to the two tank barges built by Bethlehem for the Standard Oil Company, the Standard Service and the Alaska Standard, except that the new vessel will have a slightly narrower beam and 2000 barrels less capacity than the two tankers now in service.

A significant feature in relation to the award of this contract is that this is the third order given the Union Plant of Bethlehem Corporation by the Standard Oil Company for vessels equipped with Pacific Werkspoor diesel engines. The Pacific Diesel Engine Company, Oakland, California, has a closed order with the oil company for two 400 brake horsepower Pacific-Werkspoor full diesel engines for installation in the new tanker. The engines are each to drive an electric generator supplying energy to a motor which will drive the propeller. Cargo pumps and other auxiliary machinery will be electrically driven.

The diesel engines manufactured by this Pacific Coast plant are giving great satisfaction to the owners of vessels so equipped, as is evidenced by these repeat orders. The Pacific Werkspoor Diesel Engine Company has just completed installation of two engines in a tanker for the Associated Oil Company built by the Moore Dry Dock Company.



MATSON LINER

The plans for the turbo-electric express liner to be built for the Matson Navigation Company by the American-Hawaiian Steamship Company, contract for which was awarded William Cramp & Sons Ship & Engine Building Company on condition of approval of the Shipping Board, have been turned over to Gibbs Brothers, New York naval architects, for revision in accordance with desires of the Shipping Board and the Navy Department.

The alterations contemplate the fitting of the vessel for easy conversion as a naval auxiliary without affecting her serviceability as a passenger liner. The original plans will be changed to arrange for underwater steering gear and stiffening of decks to provide for gun emplacements. The speed of the vessel may be 22 instead of 21 knots as originally planned. The gross tonnage may be 19,000 tons instead of 21,000 tons.

Work in Prospect

Specifications for the conversion of twelve Shipping Board vessels to diesel propulsion have been sent by Captain R. D. Gatewood, director of the division of maintenance and repairs of the Emergency Fleet Corporation, and bids have been asked for September 30.

Captain Gatewood first sent out a questionnaire to interested ship operators in order to determine the type of vessel most desirable for conversion. The majority of the companies replying expressed their preference of 12,000-ton vessels being converted; however, the conversion committee has decided to ask for bids on the conversion of 8800-ton and 9400-ton Shipping Board vessels in order to make test of this type before ordering the larger vessels converted.

IN PACIFIC COAST SHIPYARDS

SHIP REPAIRING
SHIP BUILDING
RECONDITIONING
ENGINE REPAIRS

The specifications call for single screw, slow speed, direct reversible types, which may be either single or double acting. The first engine to be built by any company must undergo a thirty-day non-stop test. Each concern may bid on from one to twelve engines. No particular horsepower is specified, but only those engines will be considered which can be installed without making material alterations in the hull structure.

Recent Contracts

Bethlehem Shipbuilding Corporation, Union Plant, San Francisco, has a contract for an oil tank barge, 210 feet long, equipped with twin Pacific-Werkspoor diesel engines, for the Standard Oil Co. (Calif.)

The A. W. de Young Boat & Shipbuilding Company, Inc., Alameda, California, has an order for a snag boat for Army Engineers, construction of which will start about the middle of October. The boat will be a stern wheeler, oil burning; engines now on the snag boat Seiger will be installed on this new hull. All other equipment is to be new. There will be cabin accommodations for a crew of about forty men. The contract price is $78,346.

This company also recently began construction of a pile driver for the San Francisco Harbor Board on a contract of $7983.57 and 90 days.

The American Ship Building Company, Cleveland, was recently awarded contract for the construction of a freighter for Hutchison & Company. The vessel will be 580 feet between perpendiculars, 60 feet beam, and 20 feet loaded draft. She will have a capacity of 13,600 tons deadweight and a loaded speed of 13 miles. The vessel will be propelled by triple expansion engines of 2200 indicated horsepower, steam being supplied by three Scotch boilers. Delivery will be made in the spring of next year.

The Bath Iron Works, Bath, Maine, have an order for a passenger and freight steamer for the New England Steamship Co. The steamer will have a capacity for 2000 passengers and 100 tons of freight, will be 202 feet between perpendiculars, 36 feet beam, and 10 feet loaded draft, with a speed of 15 knots. Propelling machinery will consist of one 4-cycle triple expansion engine of 1200 indicated horsepower, steam furnished by two Babcock & Wilcox boilers with 4450 square feet heating surface. Keel will be laid about October 15.

The Defoe Boat & Motor Works, Bay City, Michigan, has started construction of a yacht for J. G. Monahan, 38 by 11 by 3 feet, with auxiliary gas engine of 60 horsepower.

Dravo Contracting Company has contract for five sand and gravel barges for the Ohio River Sand Company, Louisville, 130 feet by 30 feet by 7 feet 6 inches.

Marietta Manufacturing Company has a contract for an oil barge for the Standard Oil Company (Ohio), 100 feet by 16 feet by 5 feet 6 inches.

Nashville Bridge Company, Nashville, Tennessee, has orders for the following: Steamboat for the United States government, 120 feet between perpendiculars, 26 feet beam, 4 loaded draft, construction to be started the first of December; ferryboat for the Bisso Ferry Company,

140 feet between perpendiculars, 59 feet beam, and 8 loaded draft, construction to start October 15; four pontoons for the United States government.

Keel-layings

Coast Guard cutters Nos. 253-257 inc., by A. W. de Young Boat & Shipbuilding Co., Aug. 18; pile driver S. F. Harbor Board, Sept. 2.

Yacht by Defoe Boat & Motor Works for J. G. Monahan, Sept. 3.

Seminole, combination steamer, for Clyde Steamship Co., Newport News Shipbuilding & Drydock Co., Sept. 9.

Launchings

Hawaii, cargo steamer, Hawaiian Meat Co., Honolulu, Union Plant, Bethlehem Shipbuilding Corp., San Francisco, Sept. 17.

Port Costa, oil barge, Associated Oil Co., by the Moore Dry Dock Co., Oakland, Cal., Sept. 2.

Barge, Nashville Bridge Co., own account, Sept. 2.

Deliveries

American Bridge Co. delivered 8 barges to U. S. Engineers during August.

Henry Ford II, for Ford Motor Co., by The American Ship Building Co., Lorain, Ohio, Aug. 14.

Royalton, bulk freighter, to Matthews Steamship Co., by Collingwood Shipbuilding Co., Collingwood, Ontario, Sept. 1.

Steel float and hoppers, to Second Pool Coal Co., Pittsburgh, by Midland Barge Co., Sept. 1.

Deck barge, to U. S. government, by Nashville Bridge Co., Aug. 1; 6 pontoons, to U. S. Engineers, July 27.

Wm. T. Rossell, hopper dredge, U. S. Engineers, by Sun Shipbuilding Co., Aug. 15.

C. B. Harris, 24-inch pipe line dredge, U. S. Engineers, by Charles Ward Engineering Works, Aug. 18.

Repair Awards

Commercial Iron Works, Portland, Oregon, was awarded contract on Sept. 3 for engine room repairs to the steamer Greylock to cost $6400

* * *

Main Iron Works, San Francisco, was awarded contract on work of renewing the insulation of the refrigerating chamber of the Army Transport Cambrai, bids having been opened at San Francisco on September 10. Bidders for this work were: Main Iron Works, $12,560; Coast Refrigerator Co., $13,160; Neptune Machine Works, $13,687; General Engineering & Drydock Co., $13,900; Van Fleet-Freear Co., $13,749; Crowley Shipyards, $16,997; United Engineering Co., $17,730; Bethlehem Shipbuilding Corp., $24,664.

The Main Iron Works was also low bidder on making and installing auxiliary condensers on Shipping Board freighter Salinas.

* * *

United Engineering Company, San Francisco, was low bidder on repairs to the American-Hawaiian freighter Iowan, which was recently damaged in heavy weather. The bids opened at San Francisco were: United Engineering Co., $5610; Bethlehem Shipbuilding Corpn., $6740; Moore Dry Dock Co., $6500; General Engineering Co., $7352.

* * *

Shipyard Notes

The Sound Ferry Lines, Seattle, has purchased the steamship Morning Star from the United States marshall at that port. Captain O. Joyce, manager of the ferry company, advises that the vessel will be converted into a modern automobile ferry for the Edmonds-Port Ludlow route.

* * *

The American Manganese Bronze Company, Philadelphia, has received contract from the Shipping Board for $100,000 worth of bronze propeller blades to supply Shipping Board vessels, many of which are to be converted to diesel propulsion.

* * *

The shipbuilding plant of J. Coughlan & Sons, Ltd., Vancouver, B. C., was almost totally destroyed by fire on August 30, loss being estimated at $500,000.

* * *

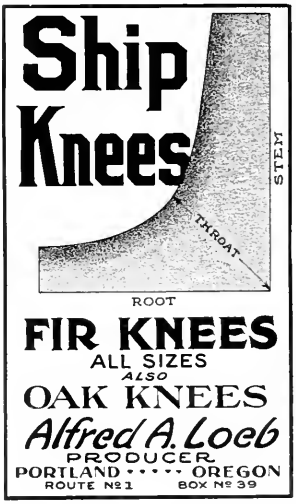
The Enterprise Engine Company, San Francisco, has shipped two Enterprise diesel engines of 165 horsepower each at Portland, Oregon, for installation in the two new tugboats for the Army Engineers in the Portland district. This company also has an order for an 165 horsepower diesel for Captain Harold Nesland, Seattle, for installation in a fishing boat; a 165 horsepower diesel for the Standard Fisheries, San Francisco, for installation in a fishing boat; and two other smaller size diesels for San Francisco and San Diego fishing interests.

* * *

A. W. de Young Boat & Shipbuilding Co., Inc., Alameda, Calif., recently overhauled the motor boat South Shore, owned by the South Shore Port Company, San Francisco. The boat was 64 feet 11 inches long, 28 feet beam, and 5 feet 6 inches draft. The shipyard added 25 feet amidships. The work was performed on a contract of $4500.

* * *

Several matters of importance were taken up at a recent meeting of the directors of the Todd Shipyards Corporation. It was decided to pay the mortgage of $200,000 on the Brooklyn plant, which would leave the corporation with no outstanding funded debt. On recommendation of the president, the directors also decided to proceed with plans for the consolidation of the



Todd Oil Burner & Engineering Corporation, Manhattan, with the Tebo Yacht Basin Company, Brooklyn, thereby reducing operating expenses of both companies. The regular quarterly dividend of $1.50 per share was also declared.

☆ ☆ ☆

Clyde Shipbuilding & Drydock Co., Ltd., was recently incorporated at Vancouver, B. C., with an authorized capital stock of $10,000, to carry on general shipbuilding, repairing, scow building and repairing, general towing, chartering, lightering and transportation business, and agency business in connection therewith.

☆ ☆ ☆

The Vancouver Shipyard, Ltd., has launched a 110-foot passenger and freight steamboat for the Harbor Navigation Co. The steamer is equipped with a 220 brake horsepower diesel engine.

☆ ☆ ☆

The yacht Alician, building at Todd Dry Docks, Inc., for C. W. Wiley, chairman of the board of directors, was launched August 30 at Seattle.

☆ ☆ ☆

The new diesel launch Hyak built by the Marine Construction Company, Seattle, for the Portland district of Army Engineers, was delivered the early part of September.

☆ ☆ ☆

Bids were asked at Victoria, B. C., on September 11 for repairs to the wrecked ore carrier Amur. The vessel's keel and 36 bottom plates are damaged. Captain Berquist, owner of the Amur, announced that he intends to install a triple expansion engine in the ship and use her in coastwise freight trade.

☆ ☆ ☆

The drydock, machine shop equipment and all other tools and equipment of the Seattle Shipbuilding & Drydock Company, Seattle, were purchased early in September by the Lake Union Drydock & Machine Works for $20,000. The Lake Union plant will move the equipment to its own plaint on Lake Unon, Seattle.

Progress of Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT
Potrero Works

Purchasing Agent: O. W. Strectt.

Hawaii, hull 5322, cargo steamer, Hawaiian Meat Co., Honolulu; 390 LOA; 56 beam; 13-6 loaded draft; 12 mi. speed; TE engs.; 2 water-tube boilers; keel June17/24; launched Sept 17/24; deliver Oct20-24, est.

No name, hull 5323, ferry steamer, Richmond & San Francisco Transp. Co.; 234 LOA; 44-10 beam; 12 loaded draft; 12½ mi. speed; TE engs.; 3 Scotch boilers, keel June19/24; launch Nov26/24, est.

No name, hull 5324, ferry steamer, sister to

A. W. de YOUNG BOAT & SHIPBUILDING CO., INC.
Alameda, Calif

Purchasing Agent, Robt. J. O'Connor.

Barge No. 4, Pac. Portland Cement Co., San Francisco; 100 LBP; 32 beam; 6 ft. 9 in. loaded draft; keel April/24; delivered June1/24.

Barge No. 5, Pac. Portland Cement Co., San Francisco, delivered June1/24.

No. 253, hull 1, cabin cruiser, Coast Guard; 200 HP Sterling high speed engines; keel Aug 18/24; deliver Nov10/24, est.

No. 254, hull 2, sister to above; keel Aug18/24, deliver Nov10/24, est.

No. 255, hull 3, sister to above; keel Aug18/24, deliver Nov10/24, est.

No. 256, hull 4, sister to above, keel Aug18/24, deliver Nov10/24, est.

No. 257, hull 5, sister to above, keel Aug18/24, deliver Nov10/24, est.

No. 258, hull 6, sister to above, deliver Feb/25, est.

No. 259, hull 7, sister to above, deliver Feb/25, est.

No. 260, hull 8, sister to above, deliver Feb/25, est.

No. 261, hull 9, sister to above, deliver Feb/25, est.

No. 262, hull 10, sister to above; deliver Feb/25, est.

Pile driver, for Harbor Board; 50x26x8; keel Sept2/24, deliver Nov2/24, est.

Yuba, [illegible] length; 37-8 beam [illegible] oil burning; accommodate [illegible] keel Oct10/24, est; deliver [illegible]

J. C. JOHNSON'S SHIPYARD
Port Blakely, Wn.

Three scows, Wash. [illegible] Co., Seattle; 105x36x10; [illegible]

THE MOORE DRY DOCK CO.
Oakland, Calif.

Purchasing Agent: N. Levy.

Port Costa, hull 787, oil barge, Associated Oil Co., S. F.; 140 LBP; 30 beam; 7-6 loaded draft; Pacific diesel engs; 220 BHP; keel May12/24; launched Sept2/24.

NAVY YARD
Puget Sound

Medusa, repair ship for government; 460 L. BP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng. 7000 HHP; 2 WT express type boilers; 10,000 tons disp; keel Jan 27/20; launched April6/23; deliver May15/24, est.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K. loaded speed; turbine eng. 7000 HHP; two WT express type boilers; 10,000 tons disp; keel April1/21; delivery April/25, est.

TODD DRYDOCK & CONSTRUCTION CORPORATION
Tacoma, Wash.

Bienville, hull 43, passenger and freight stmr, Southern Pacific Co.; 445 LOA; 63 beam; 25 loaded draft; 18 knots speed; 7000 DWT; keel Feb26/24; launched July16/24; deliver Nov/24, est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY
Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty barges, Carnegie Steel Co.; 175x26x11; 16 delivered.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft.; deliver 1924, est.

Sixteen barges U. S. Engineers, Louisville; 110x26x8.6; 8 delivered.

Fifteen barges, Amer. Steel & Wire Co., Pittsburgh; 180x28x9-3; deliver 1924.

Twelve barges, Tenn. Coal, Iron & R. R. Co.; 140x25x8-6; deliver summer 1924.

Two dump scows, U. S. Engineers, Pittsburgh; 100x26x5-10; deliver Aug27/25, est.

One car transfer barge, Missouri Illinois R. R. Co.; 225x38x10; 2 track; deliver Dec1/24, est.

Three barges, Kosmos Portland Cement Co.; 175-2x28 deliver spring 1925.

THE AMERICAN SHIP BUILDING COMPANY
Lorain, Ohio

W. H. Gerhauser, vice-president and director of purchases.

Greater Detroit, hull 785, paddle stmr, Detroit & Cleveland Nav. Co.; 535 LBP; 98 beam; 16 loaded draft; 20 mi loaded speed; 3 cyl. comp engs, 10,000 IHP; 6 SE and 3 DE Scotch boilers; 14x20 keel Feb10/23; launched Sept14/23; delivered Aug25/24.

Greater Buffalo, hull 786; sister to above; keel May2/23; launched Oct27/23.

Henry Ford II, hull 788, bulk freighter, Ford Motor Co.; 590 LBP; 62 beam; 20 loaded draft; 13 loaded speed; 12,000 DWT; 3300 IHP; Doxford diesel engs; keel Dec10/23; launched Mar 1/24; delivered Aug14/24.

No name, hull 789, freighter, Hutchison & Co.; 580 LBP; 60 beam; 20 loaded draft; 13 loaded speed; 13,600 DWT; 2200 IHP TE eng; 3 Scotch boilers, 13-6; deliver Apr/25, est.

BATH IRON WORKS, LTD
Bath, Maine

Purchasing Agent: J. L. P. Burke.

No name, hull 98, passenger and freight steamer, New England Steamship Co.; 202 LBP; 36 beam; 10 loaded draft; 15 knots loaded speed; capacity 2000 passengers, 100 tons freight; one 4 cycle, TE eng, 1200 IHP; 2 B&W boilers, 4450 square feet HS; keel Oct 15/24, est; launch April/25, est; deliver May 1/25, est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT
Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N. Massachusetts, hull 1400, battleship U.S.N.; to be scrapped.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT
Wilmington, Del.

Hull 3490, carfloat, C. R. R. of N. J.; 325 LBP; 38-6 beam; 1030 gross tons; keel May1/24.

Hull 3491; saem as above; keel May14/24.

Hull 3492, carfloat, Erie Railroad; 325 LBP; 38 beam; 1030 gross tons; keel July12/24.

Hull 3493, carfloat, sister to above; keel July 23/24.

Hull 3494, carfloat, Bush Terminal; 275x37-6 x10-1; keel June9/24.

Hull 3495; sister to above.

BETHLEHEM SHIPBUILDING CORPORATION, SPARROWS POINT PLANT
Sparrows Point, Md.

Hull 4230, carfloat, B. & O. R. R.; 283x37-6 x10-3; keel June9/24.

Hull 4231; sister to above; keel July1/24.

Hulls 4232-4233, steel dump scows, Arundel Corporation.

CLINTON SHIPBUILDING & REPAIR COMPANY
Philadelphia, Pa.

No name, hull 45, oil barge, City of Phila.; 88 LBP; 30 beam; 8 loaded draft; keel June /24, est; launch July/24, est; deliver Aug/24, est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 27x4, 30-ft cruiser, H. W. Hanan.

Hull 2773, Exp. cruiser, Harold Vanderbilt; 40x10-6; 180 HP Speedway engs.

Hull 2774, cruiser, J. B. Ford; 85x15; 2 300-HP Speedway engs.

Hull 2775, yacht tender, A. B. Deck; 23x5-8; 28 HP Speedway eng.

Hull 2777, cruiser, M. M. Belding; 50x12; 2 M-6 Speedway engs.

Hulls 2778-9, play boats for stock; 34x8-6.

Hull 2780, steel cruiser, W. O. Briggs; 118x21; 2 180 HP Sterling diesel engs.

Hull 2787, comp. tender, Harry Payne Whitney, 29x7; Gold Cup Packard eng.

COLLINGWOOD SHIPBUILDING COMPANY
Collingwood, Ontario

Royalton, hull 73, bulk freighter, Matthews Steamship Co.; 536-6 LBP; 58 beam; 31 molded depth; 13,000 DWT; 11 mi. loaded speed; 2800 h.p. TE engs; 3 Scotch boilers; 14-10-9; keel Dec11/23; launched Aug9/24; delivered Sept 1/24.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.
Philadelphia, Pa.

Purchasing Agent: Ed. C. Grehr.

Marblehead, hull 502, scout cruiser, U.S.N.; keel Aug4/20; launched Oct9/23; 99.9 per cent comp. Sept1/24.

Memphis, hull 503, scout cruiser, U.S.N.; keel Oct4/20; launched April7/24; 82.3 per cent comp. Sept1/24.

No name, hull 509, triple screw passenger and freight stmr, Matson Navigation Co.; 552 LBP; 76 beam, 26 loaded draft; 23 knots speed; 18,000 tons displ; turbo-electric engs; 20,000 SHP.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

Purchasing Agent: G. O. Williams.

C. G. 115-129, inc; 15 patrol boats for U. S. Coast Guard; 75 long; 13-6 beam; deliver first boat Oct21/24, est.

No. name, hull 92, yacht for J. G. Monohan; 38 LBP; 11 beam; 3 loaded draft; 12 mi. speed; 60 HHP gas. eng.; keel Sept3/24; launch Oct 30/24, est; deliver Nov15/24, est.

DRAVO CONTRACTING COMPANY
Pittsburgh, Pa.

Hulls 319-327, inc, 9 steel derrick boat hulls; 115 gross tons each; for U.S Engineers, Louisville, Ky.

Hull 333, sand digger; Ohio River Sand Co., Louisville; 155x42x7-6; 430 tons.

Hull 334, sand digger, Keystone Sand & Supply Co.; 155x42x7-6; 430 tons.

Hulls 335 and 336, 2 derrick boat hulls; 40x48x5-6 ft; builder's account; 100 gross tons.

Hulls 337-40, 4 steel deck barges, builder's account; 100x26x6-6; 135 gross tons ea.

Hulls 341-4, 4 sand and gravel barges, builder's account; 135x27x8; 320 gross tons ea.

Hulls 345-349, inc, 5 sand and gravel barges, Ohio River Sand Company, Louisville; 130x30x7-6; 830 gross tons each.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent: R. S. Page.

No name, hull 81; freight stmr; Southern Pacific Co.; 433 LBP; 56 beam; 26 loaded draft; 1434 loaded speed; 7950 DWT; turbine tngs, 6000 IHP; 4 B&W boilers.

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent: Chas. Short.

Edward La Bernard, hull 247, freighter, Franklin S. S. Co., Cleveland; 612 LOA; 586 LBP; 62 beam; 32 depth; 20 loaded draft; 13,500 DW T; 12 mi speed; keel Feb25,24; launched July 12,24; deliver Oct1,24, est.

No name, hull 248, bulk freighter, Columbia S. S. Co., Cleveland; 618 LOA; 592 LBP; 62 beam; 32 depth; 20 draft; 13,500 DWT; 12½ mi speed; keel June1,24; launch Oct10,24, est; deliver Mar1,25, est.

HOWARD SHIP YARDS & DOCK COMPANY
Jeffersonville, Ind.

Purchasing Agent: Jas. E. Howard.

Steel tow boat; 140 long; 32 beam; 6½ depth hold.

Two steel river boats, U.S. government.

No name, Algiers Public Service, Inc., New Orleans; 150 feet 6 inches long.

No name, ferryboat, sister to above.

MARIETTA MANUFACTURING CO.
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

No name, hull 138, sternwheel towboat; 125x30x5-2; tandem comp engs; Western rivers return tubular boilers; keel May1,24.

No name, hull 139; sister to above; keel May 15,24.

No name, hull 142, oil barge, Standard Oil Co. of Ohio, 100x18x5-6.

MIDLAND BARGE COMPANY
Midland, Pa.

Purchasing Agent: H. S. Nye

Steel boat and hoppers for Steel Pool Coal Co., Pittsburgh, launch Aug25,24, delivered Sept1,24.

MANITOWOC SHIPBUILDING CORPORATION
Manitowoc, Wis.

Pere Marquette 21, hull 209, car ferry, Pere Marquette Ry. Co.; 350 LBP; 58 beam; 16 loaded draft; 14 mi loaded speed; 2 sets TE engs; 2750 total IHP; 4 Scotch boilers, 14sixx11-18 lbs. press; keel Oct1,23, launched Mar18/24; deliver May 24, est.

Pere Marquette 22, hull 210, sister to above; keel Dec20,23, launch summer 24.

Hull 211, steel barge, War Dept., U.S.gov.; 175 ft long, 43 ft molded beam, 11 ft 6 in molded depth; keel Mar2,24.

Hull 212, steel tug, Great Lakes Dredge & Dock Co., Chicago; 75 ft long, 21 ft molded beam, 11 ft 6 in molded depth; 300 IHP Lathrop-Morse CO engs; keel Jan12 24, launch Apr27 24, est.

Hull 213, sister to above; keel Jan19 24; launch Apr1 24, est.

MIDLAND SHIPBUILDING COMPANY, LTD.
Midland, Ontario

Purchasing Agent: R. S. McLaughlin.

Tug and hull 12, bulk freighter, Great Lakes Transit Co.; 600 LOA; 60 beam; 20-6 draft; 3 Scotch boilers; keel May8 24, launch fall 1924.

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Lee F. Wrye

No name, hull 31, for W. J. Hardin & Co.; 110 LBP; 30 beam; 6 loaded draft; keel July15/24, delivery Sept 1 est.

Hulls 66-71, inc, 6 steel barges, U.S. Engineers, Cincinnati; 46 LOA; 42 beam; 6 loaded draft; keels June10 24, est; delivered July27 24.

Hull 76, deck barge, U.S. C. of E., Louisville; 120x36x7-6; keel Mar15 24, launched June 17/24; delivered Aug1 24.

Hull 77, sister to above; keel May23/24; launched July8/24; delivered Aug1 24.

Hull 86, deck barge, builder's account; 100 LBP; 24 beam; 5 loaded draft; keel July1 24.

No name, hull 81, dredge boat hull, T. L. Herbert & Sons; 110 LBP; 30 beam; 6 draft; keel July20 24.

No name, hull 82, barge, builder's account, 100 LBP; 24 beam; 5 loaded draft; launched Sept2,24.

Colvert, hull 83, steamboat, U. S. Govt.; 120 LBP; 26 beam; 4 loaded draft; keel Dec1,24, est; launch Feb1/25, est; deliver Mar1/25, est.

Hull 84, barge, builder's account; 120 LBP; 30 beam; 7 loaded draft.

No name, hull 85, ferry, Bisso Ferry Co.; 140 LBP; 59 beam; 8 loaded draft; keel Oct 15 24, est; launch Dec1,24, est; delivery Dec 15 24, est.

Hulls 86 to 89, inc., pontoons, U. S. Govt.; 40 LBP; 12 beam; 3 loaded draft; keel Sept 10 24, est; launch Oct1 24, est; deliver Oct 1 24, est.

NAVY YARD
Boston, Mass

Whitney, destroyer tender No. 4, U.S. Navy; 460 LBP; 58 beam; 20 loaded draft; 16 knots loaded speed; 10,600 tons displ.; 7000 SHP geared Parsons turbines; 2 WT express type boilers; keel Apr23/21; launched Oct12/23; deliver Oct 1/24, est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

George Washington, hull 276, freight and passenger stmr, Old Dominion Steamship Co.; 375-6 LBP; 53 beam; 29-9 depth; speed 16 knots; 2100 DWT; Newport News-Curtis turbines, 4250 SHP; B&W boilers; keel March10 24; launched Aug20 24; delivery Nov 24, est.

Robert E. Lee, hull 277, sister to above; keel Mar12/24; launch Oct25/24, est., deliver Jan/25.

Cherokee, hull 274, combination steamer, Clyde S. S. Co.; 387-6 LBP; 54 beam; 31-6 depth; 14½ loaded speed; 2600 DWT; Newport News-Curtis engs; 4200 SHP; 4 Scotch boilers; keel Aug12 24; deliver June 25, est.

Seminole, hull 275, sister to above; keel Sept 9 24; deliver Aug 25, est.

Nameless, hull 272, steam yacht for Alfred I. du Pont; 130 LBP; 22 beam; twin screw; diesel engs; keel Aug6/24.

Norfolk, hull No. 282, dredge hull, Atlantic Gulf & Pacific Co. of New York; 162 long; 38 beam; 14 depth; deliver Dec 24, est.

NEW YORK SHIPBUILDING CORP.
Camden, N. J.

Purchasing Agent: L. G. Boekwalter.

Hulls 296-9, four carfloats, N. Y. Cent. R. R. Co., 2 tracks, 366 ft long, 2 delivered

THE PUSEY AND JONES CO.
Wilmington, Del.

Purchasing Agent: James Bradford

District of Columbia, hull 1028, steel combstmr, Norfolk & Washington Steam Boat Co., Washington, D. C.; 297-7 LBP; 51 beam; 13 loaded draft; about 18 mi speed; 1600 DWT, single screw; 4 cyl TE engs, 2400 IHP; 4 Scotch boilers, 12'4 keel May3 24, launch Sept14 24, est; deliver Dec21 24, est

SPEDDEN SHIPBUILDING CO.
Baltimore, Md.

Purchasing Agent: J. Collison

Hull 260, steel hull tugboat, Grace Line, Inc., N. Y.; 76-6 LOA; 19 beam; 10 depth; 320 IHP Ingersoll Rand diesel engs; keel July15 24, launch Sept15 24, est; deliver Nov 24, est.

STATEN ISLAND SHIPBUILDING COMPANY
Staten Island, N. Y.

Purchasing Agent: R. C. Miller

No name, hull 249, steel diesel electric tugboat, Penn. R. R. Co.; 105 LBP; 24 beam, 13.5 loaded draft.

No name, hull 250, steel diesel electric tugboat, Atlantic Refining Co.; 94 LBP; 21 beam; 11.5 loaded draft.

No name, hull 251, sister to above.

No name, hull 252, sister to above

SUN SHIPBUILDING COMPANY
Chester, Pa.

Purchasing Agent: H. W. Scott.

Harry Rowell, hull 61, hopper dredge, U. S. Engineers; 245 LBP; 46 beam; 14-6 loaded draft, 11½ loaded speed; 2000 DWT; diesel-electric drive; keel June1 24; launch May21 24; delivered Aug15 24.

Hull 81, carfloat, B & O. R. R.; 285 LOA; 32-6 beam; 10-3 depth; keel July2 24, launch Sept6 24, est; deliver Sept28 24, est.

Hull 82, sister to above; keel July2 24; launch Sept6 24, est; deliver Sept28 24, est.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

C. B. Harris, hull 31, 24-in pipe line dredge, U.S. Engineers, Cincinnati, O.; 175 long by 50 by 81; pumping engs, 1000 BHP McIntosh & Seymour diesel; 2 aux 225 BHP McIntosh & Seymour engs; keel Sept20/23; launched Feb21/24; delivered Aug18/24.

Lookout, hull 33, towboat, U.S. Engineers, Nashville, Tenn.; 116 ft long; 29 ft beam; 5-6 depth; 2 surface condensing tandem comp engs, 300 IHP; 1 watertube boiler; coal burning; induced draft; keel Apr17/24; launch June14/24, est; deliver Sept29/24, est.

No name, hull 34, quarter boat, U. S. Engs., Huntington, W. Va.; 106 long; 26 beam; keel July15/24; launch Aug9/24, est; deliver Aug 15/24, est.

Hull 35, maneuver boat, U. S. Engineers, Huntington, W. Va.; 60 ft long; 20 ft beam; 3 ft 4 in depth.

Hull 36, sister to above.

Repairs

BETHLEHEM SHIPBUILDING CORP., LTD., UNION PLANT
Potrero Works, San Francisco

Engine Repairs: San Pedro, Vulcan, Howick Hall, Manchuria. Engine, boiler and hull: Matsonia, Frank G. Drum, Argyll, McKittrick, Guerrero, Frank H. Buck, Wilhelmina, Mangarin (and stewards'). Engine, boiler, and hull, dock and paint: Matsonia, San Pedro, Harvard, Romagne, Adm. Frisbie, Napa Valley, Misc., dock, paint: El Capitan, Caroline, F. A. Warner, California, H. Harper, Tuscaloosa, Gov. Irwin. Misc.: Minnesotan, Pennsylvanian, F. H. Hillman, Manchuria, Kentuckian, Carriso, Sierra (also furnish boom), S. C. T. Dodd, Ruth, Tecomb, La Brea, Monello S. S. Co, Capt. A. F. Lucas, Charlie Watson, A. H. Payson, El Segundo, R. J. Hanna, Ohioan, Tejon, Rose City, Pres. Pierce, Ventura, President Harrison. Cargo pump: La Purisima. Furnish and install 2 guarding valves: President Lincoln. Clutch: Canodohta, Buford. Propeller: El Capitan, Tug Std. Oil No. 1, Centralia (dock and paint). Strainer, suction box: Manoa. Tailshaft: Californian, Cuba. Pinion: Novo. Rep. steering gear: Covena. Renew rivets: Lina. Electrical work: A. L. Kent, Priscilla. Ventilators: Mississippian, Anchorage, Atlas, Shell Oil barges Nos. 5 and 6. Cargo chain: Samoa. C. I. rough castings: Steam schooner Vulcan, J. A. Moffett. Test heater and install coils: Maui. Blade: U. S. Grant, H. M. Storey, Cuba. Bilge suction line: Esther Dollar. One galley dresser: Richmond. One paddle wheel shaft: Emerick. Three castings: Wesvego. Twelve brass scuppers: Calistoga. Twelve diaphragms: Minnesotan. Fit 36-inch steel plate: Wm. Donovan. One forged steel lever: R. J. Hanna. Install 1 L.P. piston and rod: Kroonland. Dynamo engine: Agismith. Two sets I.P. piston rings: Lubrico. Twenty-four tension springs: Vulcan. Three boom pins: W. S. Miller.

COLLINGWOOD SHIPBUILDING COMPANY
Collingwood, Ontario

New planking and hull caulked: dredge General Meade. New stern bearing, new stern tube, bottom damage repairs: Kamaris.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
San Pedro, California

Drydock clean and paint, misc.: Yachts Zaca, Marlin, Seminole, El Cedro, Cathwood. Make and install piston rings: Vistula. Make and install 2 bronze bushings: Pacht Poinsetta. Make and install gauze nipples in vents; install distillers; misc. repairs: El Cristal. Make 48 strings: India Arrow. Make 204 retarders, machine depth, keel gage: dredge Seattle. Furnish and install worm gear: Martha Hemsoth. Bushings: Harford. Engine overhauled: Petro and Ida. Install telemotor: Agwahay. Make and install lower half of stern frame: La Purisima. Make bushings: Vancleve. Mast and boom complete: Std. Oil Barge No. 7. Misc. repairs and stocks: Paul H. Harwood. Misc.: Avalon, El Abeto, Std. Oil Barge No. 9, Catalina, Eliza Walker, R. M. Danzinger, Wm. H. Doheny, Sunnycento, R. J. Luckenbach, Dean Emery, City of Los Angeles, Curo Elano. Dredge McMullen, Yt. Cassima, Tiucarbon, Frederick R. Kelloe, Lachmar, Holger, Habo, San Pedro, Louise Hemsath, Baltic, La Encenada, W. S. Miller, Surveyor, A. C. Bedford, Arkansas, E. L. Doheny, Yt. Henrietta, Tue Peacock, Ernest H. Mayer, Harbor Dept. Barge No. 60, Dredge Arcelo, Yt. Goodwill, Tuscalusa.

NAVY YARD
Bremerton, Washington

Misc repairs and docking: New Mexico, California, Maryland. Misc repairs: Seattle, Henshaw, McCawley, Eagle No. 11. Misc. repairs incidental to operation as district craft: Mahopac, Tatnuck, Swallow, Iroquois, Sotoyomo, Pawtucket. Install refrigerating plant: Gold Star. Repairs to turbines: Meyer, Wm. Jones (repairs to reduction gear). Minor alterations: Nevada.

FUEL SAVED BY CONTRAPROPELLER

A Report of the Performance of the Steamship Norfolk

By CHAS. SKENTELBERY
Marine Superintendent, Coastwise Transportation Corporation

THE Steamship Norfolk of the Coastwise Transportation Corporation, Boston, is the first American ship to be fitted with a contrapropeller. After the installation, May 2, 1924, she resumed her run in the coal trade, and the owners have since watched the performance of the vessel very closely, in order to ascertain the saving and improvements due to the contrapropeller.

The Steamship Norfolk is a single screw, coal burning vessel, built in 1913 by the New York Shipbuilding Corporation. Dimensions and particulars are: length between perpendiculars, 310.7 feet; beam molded, 48.1 feet; depth molded, 25.5 feet; 3522 gross tons; 5800 tons deadweight capacity, 24 feet draft; 1600 indicated horsepower, normal; 68½ average r. p. m. loaded; 70 average r. p. m. ballast.

Former fuel consumption per 24 hours, 33 tons.

Former average speed loaded, 8.9 knots.

Former average speed in ballast, 10 knots.

The propelling machinery consists of one triple expansion, surface condensing engine, and two single-ended Scotch marine boilers having a working pressure of 180 pounds per square inch.

From the data listed above, it will be seen that the fuel consumption was 1.72 pounds per i. h. p. per hour; aside from this the Steamship Norfolk was a very poor steering vessel. To maintain a true course at sea was impossible, and with the engine stopped the vessel simply ceased answering her helm. This, of course, was a source of considerable inconvenience when entering and leaving port.

After the contrapropeller had been installed, the first three voyages were made, with the machinery in the same condition as before, for the purpose of testing and comparing the direct influence of the contrapropeller.

The result was:

Speed, 9.75 knots loaded, or an increase of 0.85 knots—9.5 per cent.

Speed, 10.95 knots light, or an increase of 0.95 knots.

Fuel consumption, 28 tons, or a decrease of 5 tons—15.5 per cent.

View of the contrapropeller installed on the steamship Norfolk of the Coastwise Transportation Corporation by Todd Shipyards Corporation.

Assuming that the indicated horsepower varies approximately as the cube of the speed, it follows that the horsepower would have had to be increased about 27 per cent to obtain the increase in speed stated above.

The contrapropeller produced a startling improvement of the steering ability. The master reports that the Steamship Norfolk now steers excellently, she maintains a true course at sea with very little rudder, is easy to maneuver, and keeps her steerage way for a long distance with engine stopped. Previous to the installation of the contrapropeller the feed water heater could always depend upon the steering engine for a great deal of exhaust steam. Owing to the radical improvement of the steering ability, however, it was found that the exhaust from all the auxiliaries was not sufficient to maintain the proper feed water temperature and live steam had to be added.

Comparing the indicator diagram data taken before and after the Steamship Norfolk was running with the contrapropeller, we see that the contrapropeller has effected the following savings:

An increase in speed of 1.1 knots.

A decrease in fuel consumption of 6 tons.

(Five tons compared with the average.)

A decrease in power of 52 i. h. p.

The above results are unusually favorable and, although they all must be attributed to the addition of a contrapropeller, it must be borne in mind that they include two distinct advantages; namely, improvement of the steering ability and propulsive energy gained.

PERSONAL PARAGRAPHS AND ITEMS OF INTEREST

GREAT Western Smelting & Refining Company of San Francisco announces its merger with the Eagle Smelting & Refining Works, Union Smelting & Refining Company, Trenton Refining Company, Duquesne Reduction Company, and B. Lissberger & Company, and is now conducting its business under the name of the Federated Mills Corporation. The main Pacific Coast offices will continue to be located at 75 Folsom street, San Francisco, with branches at Portland and Seattle. The management and personnel will remain unchanged.

COURSE IN SHIPPING

The University of California, Extension Division, on September 8, started a new series of class courses in Ocean Transportation at San Francisco. The first course, Shipping Practice, is being given under the direction of Norman F. Titus, assistant general manager of the McCormick Steamship Company. This class will be followed in the spring by a course in Merchant Vessels, to be given by Professor Charles P. Gross of the Department of Marine Engineering and Naval Architecture of the University of California. In the fall of 1925 the Extension Division plans a series by offering classes in Shipping Law under Carrol Single of McClanahan & Derby, and in Marine Insurance under the direction of James A. Quinby of the George E. Billings Company.

Much interest has been shown in these classes in the past and even larger attendance is anticipated for the future. The object of the instructions is to meet a very definite need on the part of men in the shipping business for concentrated and authoritative short courses dealing with the general subject of Ocean Transportation. If sufficient interest is shown it is possible that the subjects will be extended to include other classes, such as freight handling and foreign trade.

The course in Shipping Practice under Norman F. Titus is divided into fifteen lectures, as follows:

Lecture	Subject
1.	Maritime Commerce—Its History and Organization.
2.	Building and Outfitting the Ship.
3.	Preparation for Voyage.
4.	Ship Personnel — Rights, Duties and Safeguards.
5.	Ship Operation—Rules of the Road at Sea.
6.	Physical Aspects of the Vessel—Buoyancy, Stability, etc.
7.	Ports and Facilities.
8.	Cargo Handling.
9.	Stevedoring.
10.	Stowage.
11.	Bills of Lading.
12.	Charter Parties.
13.	Ocean Shipping Documents in Practice.
14.	Traffic—Agreements, Pools and Conferences. Freight Rates.
15.	Limitations and Liabilities. Cargo Claims.
16.	Marine Insurance Companies and Polices.
17.	Hull, Cargo and Freight Insurance. P. and I. Insurance.
18.	General Average and Salvage.
19.	Government Aid and Regulation of Shipping.
20.	America's Marine Policy.

GOLDEN ANNIVERSARY

Captain Robert Dollar and Mrs. Dollar celebrated their Golden Anniversary the early part of September at their home on San Rafael, across the Bay from San Francisco. A public reception was held on the afternoon of September 11, to which were invited all the employes of the Dollar interests and friends. A guest book was provided, which was signed by over five hundred and fifty guests, and there were a number who did not have an opportunity to sign. Many of the guests reminded the captain and his good wife of a similar occasion twenty-five years ago.

Captain and Mrs. Dollar started their wedded life fifty years ago with no more of the world's goods than the average young couple, and to them both is due the greatest credit and honor for the building up of one of the country's largest business houses and for developing the lumber and shipping industries of the West. The Dollar interests now encircle the world.

May they long live to enjoy the fruits of their years of work together.

PANAMA PACIFIC LINE

Reconditioning of the Panama Pacific Line's passenger steamers in anticipation of winter travel between New York and California ports via the Panama Canal started at New York with the complete overhaul of the liner Finland, now just completed. Hull, machinery, and passenger accommodations were thoroughly reconditioned, replacement being made where needed and new fittings added in public rooms and staterooms, including entirely new floor coverings throughout the first, second, and third class quarters. The other ships, the Kroonland and the Manchuria, will be overhauled in turn upon their arrival at New York.

J. H. Mahool, traffic manager for the Panama Pacific Line, declares that prospects are excellent for tourist travel to California in the coming winter in addition to the steady volume of regular traffic that moved throughout the year. East bound ships of the Panama Pacific Line are now stopping several hours at Balboa, enabling passengers to visit the City of Panama and the remains of Old Panama. A half day stop is made both ways at Havana.

PACIFIC MARINE REVIEW'S
INTERCOASTAL-OFFSHORE-COASTWISE
DIRECTORY
LINES SERVING PACIFIC COAST PORTS

INTERCOASTAL

SAN FRANCISCO

AMERICAN-HAWAIIAN S. S. CO.
215 Market street. Phone Douglas 9560.
FREIGHT ONLY
SAILINGS—Weekly from Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Astoria, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Gulf ports.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore, Portland, Me.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Garfield 4300.
PASSENGERS AND FREIGHT.
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles, and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between San Francisco, Seattle, Vancouver, B. C., Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

GARLAND STEAMSHIP CORP.
General Steamship Corporation
240 Battery street. Telephone Garfield 42
FREIGHT ONLY.
SAILINGS—Every 2 weeks between San Francisco, Seattle, and Los Angeles and Norfolk, Baltimore, and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore, Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
200 California street. Phone Douglas 7600.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 21 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Co., Pacific Coast agts.
215 Market street. Phone Kearny 5500.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle, Tacoma, Vancouver, B. C.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight.
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Bal-

[illegible]

SAILINGS—Direct Freight Service.
Every 7 days. Eastward calls: San Francisco, Los Angeles. Westward: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARRIBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company
Passenger Offices: 460 Market street. Phone Douglas 8680.
Freight and Operating Offices: Pacific Steamship Co., 60 California st. Phone Sutter 7500.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
W. D. Bertain, Pac. Coast Mgr.
311 California street. Phone Garfield 670
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los An[illegible]

UNITED-AMERICAN LINES, INC.
Sec. [illegible] Pacific Coast Agency
310 California street. Phone Garfield 2846.
FREIGHT ONLY.
SAILINGS—Weekly, between New York, Balboa, San Francisco, Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
A. F. Zirk, Pacific Coast agent.
110 California street. Phone Douglas 1670
FREIGHT ONLY.
SAILINGS—Intercoastal
[illegible]

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Dearborn, agent.
Mutual Life Building.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Port[illegible]

SAILINGS—
[illegible]

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Alaska Exchange Building.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Seattle, Portland, San [illegible] and New York.

DOLLAR STEAMSHIP LINE
Robert Dollar Co.
[illegible]
FREIGHT ONLY
SAILINGS—Intercoastal Service.
[illegible]

TWO PROMOTIONS

W. S. McPherson, Los Angeles agent for the American-Hawaiian Steamship Company, has been appointed general agent for the Atlantic Coast with headquarters at New York. Fred A. Hooper, assistant traffic manager at the San Francisco office of the company, has been named to fill the position vacated by Mr. McPherson at Los Angeles.

Mr. McPherson has been with the American-Hawaiian Steamship Company for sixteen years, having entered the employ of the company in New York when the company was operating on the Tehuantepec route. When service was discontinued during the war Mr. McPherson became a member of the firm of McCormick, McPherson & Lapham, which firm has since the war acted as agents for the American-Hawaiian company at Los Angeles.

Mr. Hooper, who is rated as one of the best traffic men on the coast, entered the employ of Williams, Dimond & Company, general agents for the American-Hawaiian, in 1907. When the American-Hawaiian Steamship Company moved its head office to San Francisco, Mr. Hooper headed the traffic department which went over the American-Hawaiian company.

STEAMER PURCHASED

A. P. Hammond of San Francisco has purchased the Shipping Board freighter West Katan. The steamer is to go on drydock at the plant of Moore Dry Dock Company for inspection and survey prior to the closing of the deal.

GLEASON GOES EAST

Captain Henry Gleason, assistant general manager of the Pacific Mail Steamship Company, San Francisco, has gone to Washington to confer with the Shipping Board relative to the operation of the trans-Pacific "535's" in connection with a decision of the Shipping Board to reduce the speed of the steamers from 17½ to 15 knots.

INTERCOASTAL

GARLAND STEAMSHIP CORP.
General Steamship Corporation, agents.
Colman Building. Phone Elliott 5706.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Seattle, San Francisco, Los Angeles and Norfolk, Baltimore, and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
L. C. Smith Building. Phone Elliott 1206.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 21 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
Pier 6. Phone Elliott 5367.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco, Portland, Tacoma and Seattle; monthly to Jacksonville, Fla.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
Lobby 4 Central. Phone Elliott 6383.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Office, 619 Second avenue.
Pacific Steamship Company, agents.
L. C. Smith Building. Phone Elliott 2068.
SAILINGS—Intercoastal.
Regular intervals between New York, San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
Transmarine Corporation.
4421 White Building. Phone Elliott 6127.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, agents.
Arctic Club Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
Smokane Street terminal. Phone Elliott 6657.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, and New York, Philadelphia, Norfolk and Baltimore.

LOS ANGELES

AMERICAN-HAWAIIAN S. S. CO.
W. S. McPherson, agent.
Central Building. Phone 821-336.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Astoria, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Astoria, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
638 San Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks from Vancouver, Seattle, Portland, San Francisco and Los Angeles to New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.

DOLLAR STEAMSHIP LINE
212 Mortgage Guarantee Bldg., 626 So. Spring St. Phone 874-891.
PASSENGERS AND FREIGHT
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Sailings between Los Angeles, San Francisco, Seattle, Vancouver, B. C., New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

GARLAND STEAMSHIP CORP.
General Steamship Corporation, agents.
541 South Spring street.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Seattle, San Francisco and Los Angeles and Norfolk, Baltimore and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company.
208 West Eighth street. Phone Main 808.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.
SAILINGS—Gulf Service.
Every 21 days from Vancouver, Seattle, Tacoma, Portland, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
Line Material Bldg. Phone Metropolitan 6140
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma; monthly to Jacksonville, Fla.

PACIFIC MAIL STEAMSHIP CO.
Passenger Offices: 503 South Spring street.
Freight Offices: 108 West Sixth street.
SAILINGS—Passengers and Freight.
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Baltimore, Norfolk, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Los Angeles and San Francisco.
SAILINGS—Direct Freight Service.
Every 7 days. Eastward calls: San Francisco, Los Angeles. Westbound: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
703 Transportation Bldg. Phone VAndike 4259.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA-PACIFIC LINE
International Mercantile Marine Company.
Freight Offices: Pacific Steamship Company, 322 California National Bank.
Passenger Offices: 510 So. Spring st. Phone 872-511.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
(Transmarine Corporation.)
G. T. Campbell, agent.
A. G. Bartlett Bldg. Phone Broadway 2580-2581.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED AMERICAN LINES, INC.
Los Angeles Steamship Company, agents
407 General Petroleum Bldg.
FREIGHT ONLY
SAILINGS Weekly between New York, Baltimore, San Diego and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company.
Stock Exchange Building.
FREIGHT ONLY.

CAPTAIN McINTOSH

Captain Bob McIntosh, for years in the marine contracting and shipping business at Portland, Oregon, is preparing to engage in the stevedoring business at that port and already has assembled the necessary gear. Captain McIntosh is ready to serve in both the stevedoring and ship lining work.

NEW CHIEF

Ernest F. Prince is now chief engineer of the Panama Pacific liner Kroonland, in service with Captain James E. Roberts. Mr. Prince was on the vessel when she made her first trip in the reestablished intercoastal line, but was later transferred to the freighter Montauk.

KOLSTER COMPASS

Under command of Captain G. T. January, the United States Shipping Board liner President Pierce of the Pacific Mail Steamship Company's trans-Pacific service, sailed from San Francisco September 2 with a capacity freight and passenger list. The President Pierce, while in port at San Francisco, was equipped with the Kolster radio compass, which is manufactured by the Federal Telegraph Company of San Francisco.

OROWAITI ABANDONED

The oil tanker Orowaiti, owned by the Union Steamship Company of New Zealand, which went on the rocks at Point Sal, Ventura County, California, is reported a total loss and attempts to remove her have been abandoned. This vessel was en route from Wellington, New Zealand, to Port San Luis in ballast when she met her disaster.

NEW RIVER SERVICE

The Harkins Transportation Company freighters Lurline and Undine are now calling at Longview, Washington, daily, lifting freight, according to an announcement by Guy L. Anderson, traffic manager for the Longview, Portland & Northern Railway Company. The Harkins Line operates a passenger service between Longview and other points on the Columbia River. Longview merchants are thus afforded improved travel and freight facilities.

ZIPF CHAIRMAN

A. F. Zipf, Pacific Coast manager of the Williams Line, has been elected chairman of the Eastbound Intercoastal Conference, succeeding M. F. Cropley, traffic manager of the Pacific Steamship Company.

INTERCOASTAL

SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, and New York, Philadelphia, Norfolk and Baltimore.

PORTLAND

AMERICAN-HAWAIIAN S. S. CO.
C. D. Kennedy, agent.
Railway Exchange Building.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Astoria, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Astoria, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
400 Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Providence, Philadelphia, Baltimore and Portland, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
Spalding Building. Phone Broadway 4378.
FREIGHT ONLY.
SAILING—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 21 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
181 Burnside street. Phone Broadway 1498.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland and Seattle; monthly to Jacksonville, Fla.

PACIFIC MAIL STEAMSHIP CO.
Norton, Lilly & Co., agents.
Yeon Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days. Eastward calls: San Francisco, Los Angeles, Westbound: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland, and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
1008 Spalding Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Pacific Steamship Company, freight agents.
Admiral Line Terminal.
SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

UNITED AMERICAN LINES, INC.
Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

VANCOUVER

ARGONAUT STEAMSHIP LINE
B. W. Greer & Son, Ltd.
602 Hastings St., West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Every 30 days, Vancouver to Montreal. Through bills of lading from other Pacific Coast ports.

DOLLAR STEAMSHIP LINE
Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Vancouver, B. C., Seattle, San Francisco, Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

ISTHMIAN STEAMSHIP LINES
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Empire Shipping Company, Ltd.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 21 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Los Angeles to Galveston, New Orleans, and Mobile.

MUNSON-McCORMICK LINE
Kingsley Navigation Company, Ltd.
625 Pacific Building. Phone Seymour 9506.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco and North Pacific Coast ports.

PACIFIC-CARIBBEAN GULF LINE
Dingwell Cates & Co., Ltd.
418 Pacific Building.
FREIGHT ONLY.
SAILINGS—Monthly from North Pacific ports, San Francisco, San Diego, Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports.

ORIENTAL

SAN FRANCISCO

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
Dodwell & Company, Ltd., agents.
2 Pine street. Phone Sutter 42.1.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.

Robert Dollar Building.

PASSENGERS AND FREIGHT
SAILINGS—Trans-Pacific
and Suez

FREIGHT ONLY
SAILINGS—Trans-Pacific
Los Angeles

RADIO CORPORATION

The Pacific Division of the Radio Corporation of America moved its offices on September 15 to spacious new quarters occupying the entire seventh floor of the Rosenstock Building, 28 Geary street, San Francisco. The Pacific Division includes a sales department, marine department, and transoceanic department.

MARINE RULINGS

Furness, Withy & Company, Ltd., have issued an addition to the booklet entitled "Liner Bills of Lading," which was released in January, 1923. The addendum contains the text of the Carriage of Goods by Sea Act, which takes effect in Great Britain January 1, 1925. An introductory note states that this will no doubt result in similar acts being passed by all maritime countries, whose representatives attended the diplomatic conference held at Brussels in 1922 and who agreed upon the original draft International Convention. Last June Sir Frederick Lewis, director general of Furness, Withy & Company, stated that his line had up to then issued at least 50,000 bills of lading under the Hague Rules without a single case of litigation or even dispute arising as to the meaning and construction of the rules.

OPENS OFFICES

Colonel William G. Atwood, consulting engineer, formerly director of Marine Piling Investigations, announces the opening of offices at 50 Church street, New York City. Colonel Atwood will specialize in details of construction, design, and operation of harbor and railway terminal facilities, problems in transportation design, operation, and economics both domestic and foreign.

PILOT SERVICE

Captain E. Reiner, a well-known mariner in coast shipping circles and who holds the rank of lieutenant-commander in the Naval Reserve, has been appointed official harbor pilot at Long Beach, California. The fast power-boat Kickapoo of Los Angeles Harbor will be purchased and serve as the first official Long Beach pilot craft.

HARBOR COMMISSIONER

Frank Mellitz has been named Harbor commissioner of the Port of Los Angeles, it is announced by Mayor George E. Cryer, succeeding O. B. Kibele, who se[illegible] expired in July.

ORIENTAL

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
Merchants Exchange Bldg. Phone Sutter 3414.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NIPPON YUSEN KAISHA

Dodwell & Company, Ltd., agents.
2 Pine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Regular service between China, Japan ports and United States Atlantic ports via Panama Canal, vessels calling at San Francisco on both outward and homeward voyages. One arrival monthly from Japan, discharging cargo at San Francisco. One to two sailings monthly homeward, occasionally loading cargo for Yokohama, Kobe and Shanghai.

OSAKA SHOSEN KAISHA

McCormick, McPherson & Lanham.
503 Market street. Phone Kearny 3632.
SAILINGS—San Francisco Service (FREIGHT ONLY).
Monthly service to and from Yokohama, Kobe, Moji, Shanghai, Hongkong and Singapore.
SAILINGS—Los Angeles Service (PASSENGERS AND FREIGHT).
A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, the Panama Canal and Los Angeles.

PACIFIC MAIL STEAMSHIP CO.

508 California street. Phone Sutter 3400.
(Operating U. S. S. B. vessels.)
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific Service.
Every 14 days from San Francisco to Honolulu, Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—Hongkong-India (Freight Only.)
Connection at Hongkong every 2 weeks for India ports.

ROOSEVELT-KOKUSAI LINE

General Steam-ship Corporation, agents.
240 Battery street. Phone Kearny 4170.
FREIGHT ONLY.
SAILINGS—At frequent intervals from San Francisco and Los Angeles to Yokohama, Kobe, Shanghai, Hongkong and other Oriental ports.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels.)
112 Market street. Phone Sutter 7640.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular intervals from Los Angeles, San San Francisco, thence direct to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Dairen, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA

(Oriental Steam-ship Company.)
549-51 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Twice a month between San Francisco, Honolulu, Yokkaima, Kobe, Nagasaki, Shanghai and Hongkong.
SAILINGS—Monthly to China and Japan on steamers from the West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings on round-the-world service and Oriental New York via Panama Canal.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
222 Robert Dollar Bldg. Phone Garfield 3499
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and K be and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

SEATTLE

ADMIRAL ORIENTAL LINE

L. C. Smith Building. Elliott 2068.
SAILINGS—PASSENGERS AND FREIGHT.
Every 12 days between Seattle, Victoria, B. C., Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—FREIGHT ONLY.
Regular service to Vladivostok, Dairen, Tientsin, Taku Bar, Tsingtau, Shanghai and Japan ports on either outward or homeward voyages, as freight offers justify direct call.
SAILINGS—Monthly service to Yokohama, Kobe, Shanghai, Foochow, Amoy, Swatow, Manila, Cebu and Iloilo.

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Stuart Building. Phone Elliott 1247.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

DOLLAR STEAMSHIP LINE

Admiral Oriental Line, agents.
L. C. Smith Building. Phone Elliott 6794.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular service from Pacific Coast ports to Shanghai, Kobe, Hongkong, Manila returning via Los Angeles and San Francisco.

R. T. JOHNS & COMPANY

R. T. Johns & Company, agents.
Central Building. Phone Elliott 2657
FREIGHT ONLY.
SAILINGS—Tramp service between Seattle and Oriental ports of Yokohama, Kobe, Nagoya, Shimidzu and Moji.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
American Building. Phone Elliott 1450.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco, Portland, Seattle and Puget Sound ports, thence to China and Japan.

NIPPON YUSEN KAISHA

Colman Building. Phone Elliott 3515.
PASSENGERS AND FREIGHT.
SAILINGS—Frequent intervals, calling at Victoria, B. C., Vancouver, B. C., Yokohama, Kobe, Nagasaki, Shanghai, Hongkong or other Oriental ports as inducements offer.

OSAKA SHOSEN KAISHA

W. C. Dawson & Company, agents.
Mutual Life Building. Phone Elliott 7842
PASSENGERS AND FREIGHT.
SAILINGS—Regular frequent service to Yokohama, Kobe, Moji, Dairen, Shanghai, Manila and Hongkong.

SUZUKI & COMPANY

Colman Building. Phone Main 7806.
FREIGHT ONLY.
SAILINGS—Irregular service between Seattle and Japanese ports.

THORNDYKE SHIPPING CO.

L. C. Smith Building. Phone Main 3166.
FREIGHT ONLY.
SAILINGS—Regular service between Puget Sound ports and Orient. Regular sailings from Kobe, Moji, Nagoya, Osaka, Yokohama, Hongkong, Manila, Shanghai, Dairen, Taku Bar and Tsingtau.

WALKER-ROSS, INC.

L. C. Smith Building. Phone Elliott 1274
FREIGHT ONLY.
SAILINGS—Regular service between Seattle and Yokohama, Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
Central Building.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Seattle to Yokohama, Kobe, Osaka and Nagoya.

LOS ANGELES

CANADIAN GOVERNMENT MERCHANT MARINE

Dodwell & Company, Ltd., agents.
412 Rialto Building. Phone Main 8294
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly steamers from Puget Sound, Yokohama, Kobe, Shanghai, Hongkong, Manila, Dairen, Taku Bar, Tsingtau and Los Angeles and San Francisco.

DOLLAR STEAMSHIP LINE

[illegible]
PASSENGERS AND FREIGHT
SAILINGS [illegible]
FREIGHT ONLY
SAILINGS—Trans-Pacific Service.
Regular service from Los Angeles to Kobe, Shanghai, Hongkong, Manila returning via San Francisco.

OSAKA SHOSEN KAISHA

[illegible]
PASSENGERS AND FREIGHT
SAILINGS [illegible] Yokohama, Kobe, Osaka and Nagoya.

TRADE ENVOY

Major Le Roy Hodges, director of the Norfolk Chamber of Commerce, is en route to Pacific Coast ports from Virginia to establish closer trade relations between Norfolk and the North Pacific.

REORGANIZATION

Following the purchase by George F. Thorndyke of the stock held by the Trenholme interest, the Thorndyke-Trenholme Company, Inc., of Seattle, has been reorganized as the Thorndyke Shipping Company, according to the firm's announcement.

BLUE STAR LINE

The Admiral Oriental Line, agents for the Blue Star Line at Seattle, announces the fall and winter schedule of the Blue Star fleet, which comprises refrigerator steamers operating from Pacific Coast ports to Glasgow, Liverpool, Southampton, and London, via the Panama Canal. The first sailing in the new schedule will be the steamer Royalstar, departing from Seattle October 22. This vessel will be followed by the Gothicstar, Tuscanstar, and Albionstar.

RHEA APPOINTED

L. M. Rhea is now assistant general freight agent in charge of Southern California traffic of the McCormick Steamship Company. The appointment was recently announced by Sam Y. Knight, general agent at Los Angeles. The McCormick Steamship Company at Los Angeles represents the Munson-McCormick Intercoastal service. Knight and Rhea's headquarters are in the Los Angeles city office in the Lane Mortgage building. Before joining the McCormick staff, Mr. Rhea was with the American Hawaiian Steamship Company and prior to that time was with the freight and traffic departments of the Los Angeles Pacific Navigation Company and the Los Angeles & Salt Lake Railroad.

ENLARGE FLEET

The Mexican Free Ports Steamship Line will add two more steamers to its fleet for service between San Francisco, Los Angeles and Mexican ports. It is announced by Krueger & Selleck, Los Angeles agents. The fleet in this service will comprise four vessels. To date this line has been operating the steamers Washington and Bolivar. The increased fleet will permit alternate calls at the ports on the Gulf of California and Southern Mexico. All steamers have excellent passenger accommodations.

ORIENTAL

Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their home-bound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, Panama Canal and Los Angeles.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels.)
701-02 Transportation Bldg. Phone Tucker 5969.
FREIGHT ONLY.
SAILINGS—Regular intervals from Los Angeles and San Francisco, thence to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Dairen, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
S. L. Breider, agent.
375 Pacific Electric Bldg. Phone TRinity 6556.
PASSENGERS AND FREIGHT.
SAILINGS—Regular to China and Japan via San Francisco on steamers of Japan, Hongkong, San Francisco line.
SAILINGS—Monthly to Oriental ports via San Francisco on steamers from West coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

PORTLAND

AMERICAN ORIENTAL SERVICE

A. M. Gillespie, Inc., agent
Board of Trade Bldg. Phone Broadway 4348
SAILINGS—Monthly to ports of Japan and China as inducements offer.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
702 Wilcox Building. Phone Main 4113.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NORTH CHINA LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Taku Bar and Dairen.

PORTLAND-ORIENT LINE

Wallem & Company, agents.
Porter Building. Phone Broadway 1844
SAILINGS—From Portland to Yokohama, Kobe, Shanghai, Tsingtao, Taku Bar, Dairen, Vladivostok.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
Oregon-Pacific Company, agents.
203-4 Wilcox Building. Phone Bdwy. 4529.
FREIGHT ONLY.
SAILINGS—Monthly from Portland to Oriental ports.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

SOUTH CHINA LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Broadway 5360
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Portland to Yokohama, Kobe, Hongkong and Manila.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company
1109 Porter Building.
FREIGHT ONLY.

SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Yorkshire Building. Phone Seymour 9576.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.

CANADIAN PACIFIC STEAMSHIPS, LTD.

Canadian Pacific Railway Station. Phone Seymour 2630.
PASSENGERS AND FREIGHT.
SAILINGS—Every 14 days from Vancouver to Japanese ports, Shanghai, Hongkong and Manila.

DOLLAR STEAMSHIP LINE

Canadian Robert Dollar Co., Ltd.
402 Pender street West. Phone Seymour 8680.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings from North Pacific ports to Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles and San Francisco.

NIPPON YUSEN KAISHA

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Vancouver and ports in Japan, China and Philippines.

OSAKA SHOSEN KAISHA

Empire Shipping Company, Ltd.
815 Hastings St., W. Phone Seymour 8014
8014
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks to all ports in Japan and China, also Vladivostok, Singapore, Bombay, etc.

SUZUKI & COMPANY

B. L. Johnson, Walton & Company.
[illegible] W. Phone Seymour [illegible]
FREIGHT ONLY.
SAILINGS—Irregular service between Pacific Coast ports and Japan ports.

WALKER-ROSS, INC.

Canadian American Shipping Company, Ltd.
[illegible] Phone Seymour [illegible]
FREIGHT ONLY.
SAILINGS—Regular service to Yokohama, Kobe, Osaka and Nagoya

YAMASHITA KISEN KOGYO KAISHA

Yamashita Co., Inc.
Merchants Exchange Building
FREIGHT ONLY.
SAILINGS—Every 2 weeks to Yokohama, Kobe, Osaka and Nagoya

UNITED KINGDOM---CONTINENTAL EUROPE

SAN FRANCISCO

BLUE FUNNEL LINE

Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.
2 Pine street. Phone Sutter 4291.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

BLUE STAR LINE

[illegible]
REFRIGERATOR AND GENERAL CARGO
SAILINGS—[illegible]

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Ltd., Managers
433 California street. Phone Sutter 4757
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast

KOLSTER COMPASS AGENTS

According to an announcement made By Ellery W. Stone, president of the Federal Telegraph Company, San Francisco, an arrangement has been made whereby the Sperry Gyroscope Company will hold the exclusive agency in China and Japan for the Kolster radio compass manufactured by the former.

This follows recognition of the fact that the radio compass is one more indispensible adjunct to safe navigation, and that its use in conjunction with the Sperry gyroscopic compass makes an ideal combination for safe navigation in all weathers. This dual arrangement has already been installed on several domestic ships and both the Sperry gyrocompass and the Kolster radio compass and position finder are rapidly taking their places of importance in maritime circles.

The day is not far distant, according to Mr. Stone, when every lighthouse and lightship will be equipped with a radio beacon for use in conjunction with the Kolster radio compass and no ship will be without this compass. Many installations have already been made and those who sail the seas in ships equipped with these devices may do so in greater safety than has ever before been possible.

INVENTOR HONORED

In response to an invitation extended by Secretary of Commerce Hoover, Dr. Frederick A. Kolster, chief research engineer of the Federal Telegraph Company, San Francisco, has been nominated to represent the point to point and marine commercial interests at the Third National Radio Conference to be held at Washington, beginning September 30. Dr. Kolster is considered as highly competent to represent these interests, having been associated with the development of radio telegraphy since its infancy. The Kolster decrometer and the Kolster radio compass and position finder are among Dr. Kolster's many contributions to radio. Ellery W. Stone, president of the Federal Telegraph Company, will accompany Dr. Kolster to Washington.

U. A. L., HAWAII

B. F. Dillingham Co., Ltd., Honolulu, has been appointed agent for the Hawaiian Islands for the United American Lines joint service with the Hamburg American Line, for their lines operating out of San Francisco through the Panama Canal to Europe and from New York direct to European ports.

UNITED KINGDOM---CONTINENTAL EUROPE

ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Service between Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation, sub-agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
710 Balfour Building. Phone Sutter 6478-6479.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports when inducements offer.

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
351 California street. Phone Sutter 6437.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES

E. C. Evans & Sons, agents.
260 California street. Phone Douglas 8040-1-2.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Co., general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint service of the Royal Mail Steam Packet Company and Holland America Line.)
401 Market street. Phone Douglas 7510
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

NORWAY PACIFIC LINE

485 California street. Phone Sutter 5099.
FREIGHT ONLY.
SAILINGS—From San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia. Sailings every 30 days.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.

Sudden & Christenson, general agents.
230 California street. Phone Garfield 2846.
For passengers, Phone Sutter 46.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SEATTLE

BLUE FUNNEL LINE

Dodwell & Company, Ltd., agents.
Stuart Building. Phone Elliott 0147

PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

BLUE STAR LINE

[illegible]
REFRIGERATOR AND GENERAL CARGO
SAILINGS—[illegible] Seattle, Portland, San Francisco to [illegible] Europe.

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.
823 Alaska Building. Phone Elliott 9104
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Service between Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation.
Colman Building. Phone Elliott 5706.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

(Furness, Withy & Company Ltd.)
Furness (Pacific), Ltd.
Borchard & Ecken, agents. 705 Arctic Bldg.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 5706.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
Stuart Building. Phone Elliott 1464.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings every 2 weeks.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company.
Alaska Building. Phone Elliott 2450
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Company.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint Service of the Royal Mail Steam Packet Company and Holland American Line.)
[illegible] Building. Phone Elliott 4944
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
[illegible]
FREIGHT ONLY.
SAILINGS—[illegible] San Francisco and Los Angeles to Marseilles and Genoa.

UNITED AMERICAN LINES, INC.

Sudden & Christenson, general agents.
[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific European Service. [illegible] Pacific ports and ports in United Kingdom and Continental Europe.

McCORMICK EXPANSION

The McCormick Steamship Company, operating coastwise, has purchased the steamer Rose City from the San Francisco & Portland Steamship Company, a subsidiary of the Union Pacific Railway System. The purchase includes all the equipment of the San Francisco & Portland Steamship Company at San Francisco. A lease has also been taken by the McCormick company on the Ainsworth dock property at Portland, and an agreement has been entered into between the McCormick Steamship Company and the Union Pacific System whereby the railroad company will erect a modern terminal on the present site of the Ainsworth dock, connecting the rail service and the coastwise and intercoastal service of the McCormick interests. The McCormick Steamship Company, according to announcement made at the Portland office, will enjoy through and joint rates on freight and passenger traffic interchanged with the Union Pacific System.

The steamship Rose City has been operated between Portland and San Francisco by the San Francisco & Portland Steamship Company, but under the new owners she will be on the run including Portland, San Francisco, and Los Angeles Harbor.

O. S. K. IMPROVEMENTS

The passage of the new immigragration law by the United States has resulted in the determination of the Japanese government to back the Osaka Shosen Kaisha in the improvement of its South American service, in order to take care of the emigration to that continent. The Japanese Diet will subsidize the Osaka Shosen Kaisha in the construction of three large motorships, which will be built under special arrangement of financing by the Mitsubishi Shipbuilding Company of Kobe. The vessels will measure 7300 gross tons and have 12,200 tons displacement, with a total carrying capacity of 8000 tons. They will be equipped with refrigeration capable of accommodating 250 tons of cargo. Each ship will carry 40 cabin passengers and 780 steerage. The first vessel will be completed in 1925, the other two in 1926 and 1927. Sulzer 2-cycle marine type diesel engines will be installed with twin screws. The first two sets of engines will be built by Sulzer Brothers at Winterthur, Switzerland, and the third set by Mitsubishi, who have taken the Sulzer license for Japan.

UNITED KINGDOM---CONTINENTAL EUROPE

LOS ANGELES

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company.)
Dodwell & Company, Ltd.
412 Union Oil Building. Phone Broadway 7900 and Vandike 4944.
FREIGHT ONLY.
SAILINGS—Every 6 weeks from North Pacific Coast ports, including San Francisco and Los Angeles to London, Liverpool and Glasgow via Panama Canal.

EAST ASIATIC COMPANY, LTD.
Balfour, Guthrie & Company, agents.
313 Union Oil Bldg. Phone 527-134.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation, agents.
541 South Spring street.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness Withy & Company, Ltd.)
Swayne & Hoyt, Inc., agents.
488 Pacific Electric Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco, Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
541 South Spring street.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducement's offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
315 Union Oil Building. Phone 7865
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom from August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
M. F. & H. R. McLaurin, Inc.
406 South Main street. Phone Main 4800
PASSENGERS AND FREIGHT
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of The Hamburg-American Line and Royal Mail Steam Packet Co.)
C. J. Lehman, agent.
123 E. Sixth street. Phone Trinity 3157.
PASSENGERS AND FREIGHT.
SAILINGS—Every 3 weeks, steamers Vancouver, Seattle, Portland, Astoria to San Francisco and Los Angeles and Liverpool, London, Rotterdam, Antwerp, Hamburg.

NORWAY PACIFIC LINE
703 Hahn Vordisc street, San Pedro.
FREIGHT ONLY.
SAILINGS—Four motorships operating from San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia. Sailings every 30 days.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Service from Vancouver, Seattle, Portland, San Francisco to Marseilles and Continental ports. Los Angeles to Marseilles and Continental ports.

UNITED AMERICAN LINES, INC.
Los Angeles S. S. Company, agents
407 Central Building.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

PORTLAND

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.)
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles and London, Liverpool and Glasgow.

BLUE STAR LINE
[illegible]
REFRIGERATOR AND GENERAL CARGO
SAILINGS—Every [illegible]
Seattle, Portland, San Francisco, Los Angeles, San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

EAST ASIATIC COMPANY, LTD.
Chalmers & Cartwright, Inc., agents.
Porter Building. Phone Broadway 4[illegible].
PASSENGERS AND FREIGHT
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.
Norton, Lilly & Company, general agents
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
(General Steamship Corporation, agents.)
Porter Building. Phone Broadway 4[illegible]
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Furness-Withy & Company, Inc.
Burchard & Fisken, agents, [illegible]
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports.

GENERAL STEAMSHIP CORP.
[illegible]
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
355 Oak street. [illegible]
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom from August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
[illegible]
355 Thurman street.
PASSENGERS AND FREIGHT
SAILINGS—[illegible]
[illegible]

NORTH PACIFIC COAST LINE
[illegible]

CALDWELL VISITOR
O. P. Caldwell, freight traffic manager for the Luckenbach Steamship Company, with headquarters in New York, has just completed a tour of the Pacific Coast ports. Mr. Caldwell expressed the opinion that the intercoastal trade will shortly show improvement, as from his observations in the various parts of the country stocks of all commodities are getting very low and even the most conservative buyers must shortly begin to order.

"THE SQUEAK"
Among the papers that have come to our desk during the past month we have been interested in "The Squeak," edted by ten-year-old Lansdon Terry Goddard, son of the sales manager of Fairbanks, Morse & Co., for Southern California. The current issue contains eight mimeographed pages of highly diversified multicolored and interesting "squeaks" on a wide variety of subjects. Terry Goddard is said to be the youngest editor on record to date.

BETHLEHEM PLANS
J. J. Tynan, vice-president and general manager of the Bethlehem Shipbuilding Corporation, San Francisco, returned recently from the East, where he had gone in connection with the Bethlehem marine type diesel engine, which the company proposes to manufacture at the Union Plant.

PASSENGERS AND FREIGHT
SAILINGS—Every 2 weeks from Vancouver, Seattle, Portland, Astoria, San Fran-

ROUND-THE-WORLD

SAN FRANCISCO

DOLLAR STEAMSHIP LINE
[illegible] Kearny street.
PASSENGERS AND FREIGHT
SAILINGS
[illegible]
FREIGHT ONLY
REGULAR SAILINGS [illegible]

LOS ANGELES

DOLLAR STEAMSHIP LINE
[illegible]
PASSENGERS AND FREIGHT
SAILINGS
[illegible]
FREIGHT ONLY
REGULAR SAILINGS [illegible]

UNITED KINGDOM---CONTINENTAL EUROPE

cisco and Los Angeles and Liverpool, London, Rotterdam Antwerp, Hamburg.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—From Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.
Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Broadway 5360.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service.
Fortnightly between North Pacific ports and and ports in United Kingdom and Continental Europe.

VANCOUVER

BLUE FUNNEL LINE, LTD.
Dodwell & Co., Ltd., agents.
Yorkshire Building. Seymour 0576.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

BLUE STAR LINE
Caughey, Roger, Dobie Co., agents.
410 Dunsmuir St. West. Phone Seymour 3454
REFRIGERATOR AND GENERAL CARGO.
SAILINGS—Every 28 days from Vancouver, Seattle, Portland, and San Francisco to Glasgow, Liverpool, Southampton, and London.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keely, Pacific Coast manager
Phone Sutter 8480.
FREIGHT ONLY.
SAILINGS Monthly to Avonmouth via Panama.

EAST ASIATIC COMPANY, LTD.
B. J. Johnson, Walton & Company, agents.
837 Hastings St. W. Phone Seymour 7147.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Hawaii, Japan, China, Manila and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
Compagnie Generale Transatlantique.)
Empire Shipping Co., Ltd. Phone Seymour 8014
FREIGHT ONLY.
SAILINGS—Once a month from Vancouver to Bordeaux, Havre, Antwerp and Hamburg.

FURNESS LINE
Furness Withy & Company, Ltd
Furness (Pacific), Ltd.
1312 Standard Bank Building
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Vancouver and other Pacific Coast ports to United Kingdom.

GENERAL STEAMSHIP CORP.
Empire Shipping Co., Ltd., 815 Hastings St., W.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—From Pacific Coast ports to United Kingdom and Scandinavia, as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company, Ltd.
Phone Seymour 6650
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December, fortnightly.

ISTHMIAN STEAMSHIP LINES
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
SAILINGS—Intercoastal Service
SAILINGS—Pacific-United Kingdom Service.
Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
C. Gardner Johnson & Company, Ltd.
Metropolitan Building. Phone Seymour 357.
PASSENGERS AND FREIGHT
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm, and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of The Royal Mail Steam Packet Co. and Pacific and America Line.)
Royal Mail Steam Packet Company, agents
Pacific Building. Phone Seymour 7108
PASSENGERS AND FREIGHT
SAILINGS—Regular services between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles and Liverpool London, Rotterdam, Antwerp, Hamburg.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight.
Twice a month between San Francisco, Los Angeles, calling at ports on West Coast of Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, and Taltal. (Other ports as inducements offer.)

TOYO KISEN KAISHA
(Oriental Steamship Company.)
549-51 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via Honolulu.

SEATTLE

GENERAL STEAMSHIP CORP.
Colman Building. Phone Elliott 5706.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE
W. R. Grace & Company, agents.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports of Peru and Chile as inducements offer.

LATIN AMERICA LINE
Lea Mathews Shipping Corporation.
Alaska Building. Phone Elliott 4567.
FREIGHT ONLY.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Seattle, Portland and San Francisco to all ports on West Coast of Mexico and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Seattle, Portland and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

PAC.-ARGENTINE-BRAZIL LINE
(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc., managers.
Lobby No. 4, Arcade Bldg. Phone Elliott 6383
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Lotuc, and San Juan, Curacoa, Montevideo, Buenos Aires and Santos; also as inducements offer, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

PAN-PACIFIC LINE
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta and Taltal. (Other ports as inducements offer.)

LOS ANGELES

GENERAL STEAMSHIP CORP.
241 South Spring street.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE
M. F. & H. R. McLaurin, Inc.
406 South Main street. Phone Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports in Peru and Chile as inducements offer.

MEXICAN FREE PORTS S. S. LINE
Wheaton & Krueger, 503 Transportation Bldg.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to West Coast of Mexico.

MEXICAN STATES LINE
McCormick, McPherson & Lapham, agents.
503 Transportation Bldg
PASSENGERS AND FREIGHT.

Mexico---Central America--Canal Zone---South America

SAN FRANCISCO

GENERAL STEAMSHIP CORP.
240 Battery street. Phone Kearny 4100
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE
W. R. Grace & Company, general agents.
332 Pine street. Phone Sutter 3700
PASSENGERS AND FREIGHT
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports of Peru and Chile as inducements offer.

LATIN-AMERICA LINE
R. S. Silva & Company, general agents.
340 Crocker Building. Phone Sutter 5712
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Portland, Seattle and San Francisco to all ports on West Coast of Mexico, and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Portland, Seattle and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

McCORMICK STEAMSHIP CO
215 Market street.
PASSENGERS AND FREIGHT.
SAILINGS—Every three weeks from San Francisco to San Jose del Cabo, La Paz, Guaymas, Topolabampo, Mazatlan, San Blas and Manzanillo.

MEXICAN FREE PORTS S. S. LINE
Williams, Dimond & Company, Agents.
310 Sansome street. Phone Sutter 7400.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to the West Coast of Mexico.

MEXICAN STATES LINE
Williams, Dimond & Company.
310 Sansome street. Phone Sutter 7400
PASSENGERS AND FREIGHT.
SAILINGS—Every 8 days from San Francisco and Los Angeles to West Coast of Mexico and Central America.

PACIFIC LINE
The Pacific Steam Navigation Company.
550 Market street. Phone Sutter 4632
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service via Panama Canal, Guayaquil, Callao, Mollendo, Arica, Iquique, Antofagasta, Mejillones, Talcahuano, Coronel, also to Havana and New York; also via Panama Canal and Kingston to Spain, France and England. Steamers connect at Panama for South American West Coast ports.

PAC.-ARGENTINE-BRAZIL LINE
(Operating U. S. S. B. vessels.)
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Lotuc, and San Juan, Curacoa, Montevideo, Buenos Aires and Santos; also as inducements offer, Para, Pernambuco, Bahia, Rosario and Bahia Blanca.

SUGGESTIONS FOR THE FOREIGN TRADER

American Representation Needed in Java

Direct participation by American firms in the trade of the Netherlands East Indies is urged by the American trade commissioner at Batavia as the only means of enlarging American markets in this territory. Dutch, German, and British firms are going to show preference for goods from their home market, aside from the fact that prevailing exchange conditions make it profitable for them to do so. There is, however, no valid objection to American goods and they will sell in this district with the right kind of salesmanship. Although the bulk of sales will continue to be made on a price basis, American goods have actually sold in some cases despite higher prices. Business conditions in the islands are good, despite pessimistic reports which frequently emanate from commercial centers. Competition is keen and profits are small, but the export trade is flourishing and overstocks no longer deter the revival of sane and satisfactory business operations.

C. I. F. Quotations Are a Convenience to Customers

American exporters should quote prices c. i. f., as a convenience to their customers, wherever possible. A prominent London importer recently said: Quotations f. o. b. Cincinnati prevented us from estimating delivered costs, and prices were not sufficiently attractive to cause us to take the trouble to secure rail rates from Cincinnati to the Atlantic seaboard." With the services now offered by the railways at some 2700 offices, in supplying information on ocean rates and sailings and in the issuance of through export bills of lading in connection with American ships, it has become easy for the American exporter to quote c. i. f. By so doing he not only serves his customer and hence himself, but he also is able to patronize American shipping.

Good Packing Popularizes American Goods

A New England publication, commenting on the increasing popularity of our products in Latin America, suggests that possibly this is due to the fact that exporting manufacturers have been placing greater emphasis on the proper packing of their goods. A consignment of goods, well packed in a substantial container of good quality, creates an impression on the recipient similar to that made by a well-written letter that is inscribed on high-class stationery. Good packing is not necessarily costlier packing, but rather the application to the problem of the well-defined scientific principles so widely advocated by the Bureau of Foreign and Domestic Commerce. There is no surer way of popularizing your products than by packing them carefully and economically, so they will reach your customer in prime condition and at the lowest possible cost.

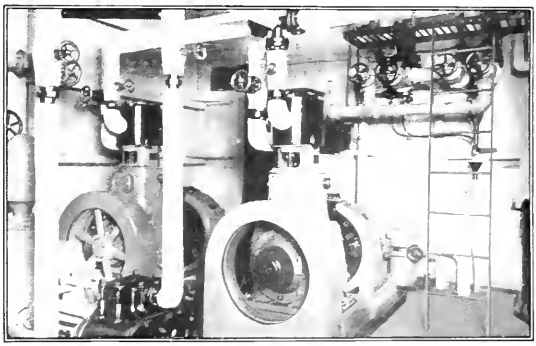
Know Your Climate Chemically

An American traveling in Ceylon recently bought a tube of a well-known shaving cream manufactured in the United States. His wife purchased a bathing cap. The tube containing the cream was in such a state of decomposition that very slight pressure burst it open in several places. The green rubber band on the bathing cap broke and fell off. Upon examination of the dealer's stock it was found that all of the tubes were in a similar condition. All the caps with green bands likewise were defective, that color apparently having a deteriorating effect upon rubber in Ceylon. It is not enough, therefore, imply to know the requirements of the population of a foreign climate. The chemical composition of your products and their containers must be such as to withstand exposure to it.—(Commerce Reports.)

Pacific Marine Review

The National Magazine of Shipping

NOVEMBER, 1924



Official Organ
PACIFIC AMERICAN STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION OF THE PACIFIC COAST

Pacific Marine Review, Vol. 21, No. 11. Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. $2.00 a year.

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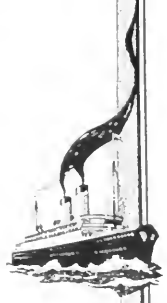
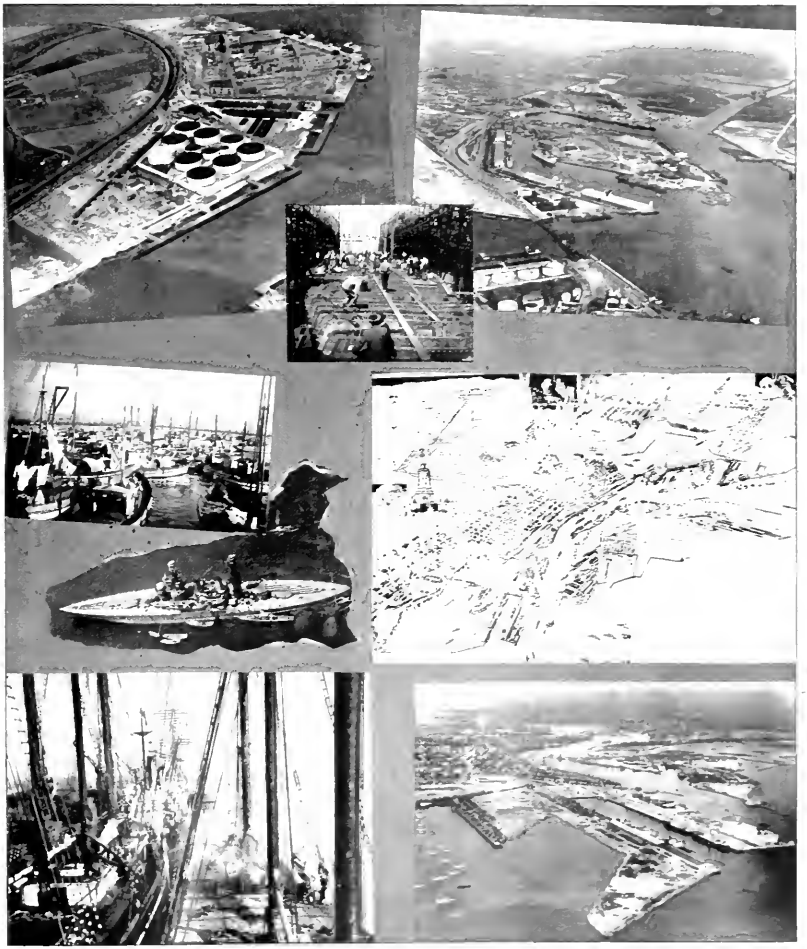


LOS ANGELES HARBOR



Upper Left—Associated Oil Company loading tank West [illegible] Lower Right—Bird's eye view of the harbor
Lower left—Lumber schooners docked in the harbor. Lower [illegible]

NOVEMBER, 1924 Vol. XX. No 11

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

339 AT 30 CHURCH STREET NEW YORK

James S. Hines, President and Publisher.

Bernard N. De Rochie, Vice-Pres. and Manager.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1924, by J. S. Hines.
Published on the 25th of each month preceding the publication date.
Advertising and editorial forms close on the 20th.
Subscription price, a year: domestic, $2; foreign, $3; single copies, 25c.

Alexander J. Dickie, Editor.

Paul Faulkner, Advertising Manager.

SAN FRANCISCO SHIPPING FELLOWSHIP

First Steamship Dinner in the Pacific Coast Metropolis Brings Operators Under All Flags Together in a Demonstration of Friendship

A SAN FRANCISCO Steamship Club looms high, for on October 25 the leaders of San Francisco shipping laid the keel with enthusiastic support. The gathering at the Palace Hotel enjoyed San Francisco's first steamship dinner, and the success of this first fellowship meeting marks the event as a valuable and important function.

To W. J. Edwards, Norton-Lilly's Pacific Coast chief, goes credit for superb general chairmanship. Harry Scott, head of the General Steamship Corporation, established himself as a master of entertainment. Untiring effort made the steamship dinner a splendid success. It must have a place on the calendar of every year.

Now that construction is under way we are all pulling for the foundation of a San Francisco Steamship Club, conveniently located somewhere in the heart of the shipping district, where the crowd may gather for luncheon and, in comfortable quarters, have a haven for the cultivation of good fellowship.

Such a clubroom could be adorned with trophies and relics of the port, and from the outset be one of the most unique places in any city anywhere. With Mr. Edwards harboring this most admirable enterprise and the support of the marine fraternity responding to call, it is our prediction that the San Francisco Steamship Club makes this grandest of ports in early time!

Other shipping centers have proved that marine clubs prosper—San Francisco can have a club that will be known around the world!

The S. S. Ba[illegible]

THE SHIPPING SITUATION

IN a recent issue of Commerce Reports, A. E. Sanderson of the Transportation Division of the Department of Commerce, analyzes the world shipping situation from the standpoint of available tonnage and shows some very interesting trends in charter rates and in a return toward normalcy of the ship owning situation.

Of great interest is the first statement in this article, "While the available seagoing tonnage of the world's merchant marine has decreased during the year ended June 30, 1924, by about .7 of 1 per cent, its idle tonnage has decreased by 24 per cent."

Idle shipping of principal maritime countries

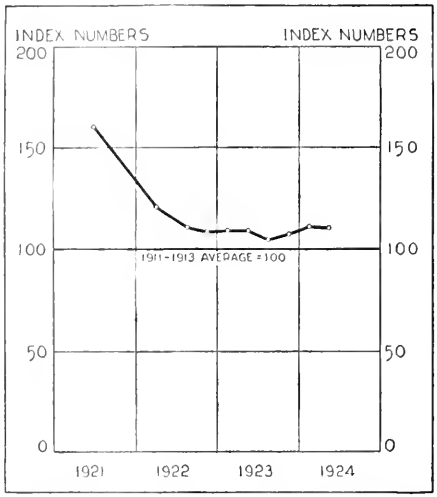
[In gross tons]

Country	Jan. 1, 1923	July 1, 1923	Jan. 1, 1924	July 1, 1924
Idle in home country				
United States				
Shipping Board	1,111,000	3,771,000	3,761,000	3,021,000
Shipping Board tanker	211,000	211,000	211,000	141,000
Privately owned	75,000	165,000	441,000	312,000
Government owned, other than U. S. Shipping Board	(1)	70,000	3,000	(1)
Total United States	1,328,000	4,277,000	4,271,000	3,474,000
United Kingdom	1,010,000	1,161,000	901,000	740,000
France	710,000	727,000	450,000	417,000
Italy	172,000	159,000	127,000	272,000
Netherlands	150,000	250,000	245,000	124,000
Norway	6,000	28,000	50,000	24,000
Sweden	22,000			
Greece	70,000	94,000	122,000	91,000
Japan	70,000	90,000	29,000	23,000
Belgium	150,000	161,000	86,000	47,000
Denmark	17,000	7,000	14,000	
Spain	220,000	241,000	128,000	66,000
Australia	100,000	210,000	(2)	87,000
Idle in foreign countries (3)	170,000	39,000	51,000	61,000
Grand total	9,128,000	8,643,000	6,588,000	5,147,000

(1) No data available.
(2) Included in U. S. Shipping Board figure.
(3) Estimated.
(4) Refers mainly to shipping of countries listed above.

The accompanying table shows the volume of idle shipping in the various maritime nations of the world by six-months' periods, beginning January 21, 1923. It will be noted that since that time the idle tonnage owned by the Shipping Board, while it has decreased in volume, has shown a marked increase in its percentage ratio, as compared with the total idle tonnage of the world, increasing from less than 50 per cent to more than 60 per cent. The volume of overseas trade is smaller on July 1, 1924, than on July 1, 1923, and it is an encouraging factor that with the decided increase in active tonnage and the shrinkage in volume of cargo, charter rates are not falling nearly as rapidly as might have been expected.

As of June 30, 1924, the gross tonnage of steel and iron, steam and motor vessels figures at 57,477,000, so that a little over 10 per cent of the seagoing tonnage of the world's shipping is still idle. In considering the graphs showing the index number of charter rates as repoduced herewith, it must be borne in mind that there has been a marked advance in the rates in two trades, which are used in constructing this index.



These are the lumber trades from the United States Gulf ports to the River Platte and to the United Kingdom.

While the index for charter rates is now hovering around 110 that for wholesale prices is well over 150. The disparity between these two figures illustrates the present difficult financial situations for shipowners.

Ship construction has followed the variations of the charter market, registering, by Mr. Sanderson's figures, a substantial increase at June 30, 1924. But as is recorded elsewhere in this issue of Pacific Marine Review, Lloyds quarterly report shows a decline in these figures for the quarter ending September 30 last. During the first quarter of 1924 there was a slight improvement in ship prices, amounting to an advance of two dollars a ton, which advance was eliminated by the decline during the second quarter.

Gross tonnage of steel and iron steam and motor vessels of over 100 tons each, on specified dates

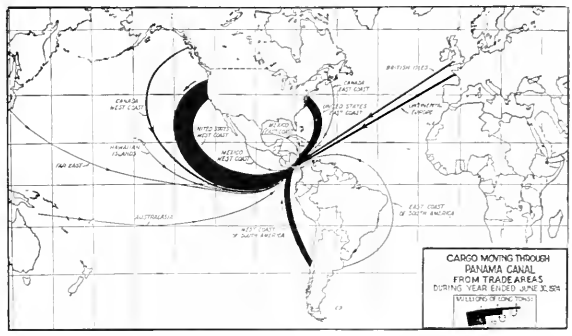
Country	June 30, 1914	June 30, 1922	June 30, 1923	June 30, 1924
United Kingdom	18,877,000	19,053,000	19,077,000	18,917,000
British Dominions	1,407,000	2,201,000	2,219,000	2,213,000
United States	1,837,000	12,506,000	12,416,000	11,770,000
France	1,508,000	3,303,000	3,265,000	3,193,000
Germany	5,090,000	1,783,000	2,496,000	2,856,000
Holland	1,471,000	2,613,000	2,606,000	2,533,000
Italy	1,428,000	2,660,000	2,789,000	2,676,000
Japan	1,642,000	3,325,000	3,402,000	3,655,000
Norway	1,923,000	2,277,000	2,299,000	2,326,000
Other countries	6,913,000	7,181,000	7,371,000	7,338,000
Total	42,514,000	56,902,000	57,959,000	57,477,000

PANAMA CANAL FREIGHT TRAFFIC

IN Commerce Reports, for October 6, there appeared a very interesting analysis of the Panama Canal traffic, from which much of the information used herein and the tables and graphs shown herewith are taken.

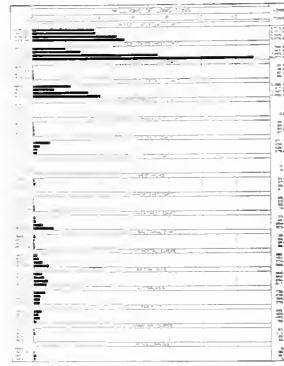
In the palmy days of America's supremacy in sailing ships our intercoastal traffic round the Horn was the great trade route. Four months was the average voyage one way, with an occasional record coming under 100 days. In 1855 this time was cut in half by the railway across Panama and steamer transshipment. The first transcontinental railway in 1869 cut the schedule for freight to three or four weeks, which, as service improved, was gradually brought down to present freight schedule of about two weeks. Then came the development of the intercoastal cargo steamship line via Magellan, a 60-day schedule with low rates, followed by the Tehauntepec Railroad across Mexico in 1901, with which road the steamships connected, giving a schedule time of about 40 days with low rates. Then came the opening of the Panama Canal in 1914, giving an opportunity for fast freighters to cut the time on through water shipments, San Francisco to New York, to 17 days and compete in dispatch with transcontinental freight shipments.

The railroad had almost cut to pieces the intercoastal sailing ship business and for a while threatened the Panama Railroad traffic. This latter, however, recovered and up to the opening of the Canal showed a very healthy growth, and the service is still used to some extent. The same growth was later shown on the Tehauntepec road. In 1912 and 1913 the Panama Railroad carried approximately 2,000,000 tons and the Tehauntepec 1,000,000 tons. Since 1921 the Mexican road has been practically abandoned and is not now in fit condition for heavy traffic. The present Mexican government has opened three free ports on this road and hopes to reestablish it as a world trade route. The graph herewith shows traffic on both railroads compared with the canal traffic.



Surveys and analyses of growth in water-borne intercoastal and other tonnage indicate that the canal in its present form will be adequate for at least fifty years.

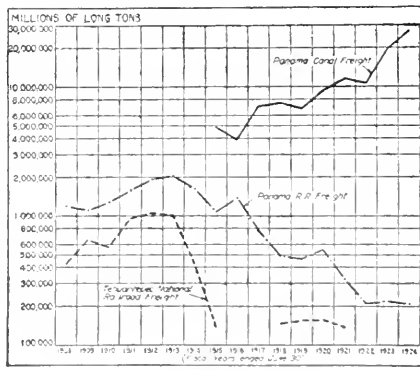
The abnormal increase in total traffic during the last two years is very largely due to Southern California petroleum shipments. These are approximately at their peak and should hold level for some time.



Diagrammatic map showing the volume of cargo moving on various trades through the Panama Canal for the fiscal year 1923-24, and a tabular draft showing the same statistics for the last four years.

Fiscal year	Atlantic to Pacific		Pacific to Atlantic		Total	
	Number of vessels	Long tons of cargo	Number of vessels	Long tons of cargo	Number of vessels	Long tons of cargo
1914–15 [1]	522	2,070,993	553	2,817,461	1,075	4,888,454
1915–16 [1]	396	1,349,010	302	1,725,095	758	3,074,114
1916–17	874	2,929,240	929	4,129,353	1,803	7,058,593
1917–18	915	2,733,500	1,154	4,892,731	2,069	7,542,041
1918–19	857	2,790,254	1,167	4,176,367	2,024	6,916,621
1919–20	1,189	4,693,516	1,288	5,241,383	2,475	9,374,199
1920–21	1,471	5,462,678	1,421	5,707,196	2,892	11,569,211
1921–22	1,309	5,486,934	1,227	5,388,976	2,736	10,884,910
1922–23	2,125	7,086,259	1,842	12,481,616	3,967	19,567,875
1923–24	2,749	7,860,300	2,480	19,134,610	5,230	26,994,710
Total	12,549	39,435,459	12,448	65,735,278	25,032	107,910,991

[1] Canal was not opened to commercial traffic until Aug. 15, 1914.
[2] Canal was closed to traffic from Sept. 18, 1915, to Apr. 15, 1916.



The above table shows the growth of westbound, eastbound and total cargo through the Panama Canal since its initial opening. The graph at the right shows these same figures as compared with similar figures for the Panama Railroad and for the Tehuantepec National Railroad.

Principal commodities moving through the Panama Canal, from the Pacific to the Atlantic, during the period July 1, 1922, to June 30, 1924

[In long tons]

Commodity	1921-22	1922-23	1923-24
Oils, various	296,394	4,388,909	9,755,341
Lumber	720,622	1,569,440	1,82 ,448
Nitrate, Chilean	470,796	1,664,731	1,744,580
Wheat	864,746	856,492	1,312,563
Ores	19 ,436	712,681	1,062,774
Canned goods (fish, fruit, vegetables, etc.)	344,601	489,461	444,595
Metals, various	179,582	347,715	360,572
Sugar	257,967	295,471	270,633
Barley	4 9,234	379,542	296,859
Cold-storage food products	193,396	138,090	167,893
Fruit, dried	(1)	90,187	103,469
Coffee	(1)	81,654	102,451
Wool	148,103	106,111	84,698
All other	1,398,409	1,430,312	1,593,726
Total	5,388,976	12,481,626	19,134,610

[1] Quantity negligible.

Principal commodities moving through the Panama Canal, from the Atlantic to Pacific, during the period July 1, 1922, to June 30, 1924

[In long tons]

Commodity	1921-22	1922-23	1923-24
Manufactured goods (including iron and steel, railroad material, machinery, textiles, etc.)	1,403,411	2,019,590	2,273,381
Oils (including crude, refined, vegetable, etc.)	988,829	1,065,184	1,122,398
Metals, various	174,104	270,703	322,896
Cement	(1)	113,726	303,724
Coal and coke	404,389	280,343	281,935
Sulphur	109,449	117,084	146,712
Automobiles	(1)	51,474	110,351
Cotton, raw	194,654	122,728	100,925
All other	2,226,068	3,045,427	3,197,778
Total	5,495,934	7,086,259	7,860,100

[1] Quantity negligible.

Note in the above tables that since 1922 there has been a healthy growth in all of the westbound commodities listed as well as in the total. In eastbound commodities several of the items show a decrease. The tremendous increase in the total eastbound being due very largely to oil and wheat.

with a gradual decrease in the not distant future. The normal growth of general cargo and bulk commodities other than oil will be taken care of with prompt dispatch and with no strain on canal equipment. In this connection it is to be noted that a large proportion of the westbound tonnage in steel and steel products is chargeable to oil pipe line, oil tank, and oil well construction. The commodity list other than oil shows a normal substantial growth, which should continue at an accelerating rate with the rapid growth of Pacific Coast population.

Of great interest is the increasing use of the canal route by automobile shippers; the tonnage (not worth while recording in 1922) had grown to 110,000 long tons in 1924.

SELLING FRUIT TO THE ORIENT

THE Chamber of Commerce of Sacramento has recently put in operation a forward-looking policy toward introducing California food products into Oriental markets.

In conjunction with the Dollar Line round-the-world service they have sent out a number of exhibits of California fruits and vegetables, both in cans and in glass, and also in solution for large exhibition vases. These are being placed on exhibition in various foreign ports in chambers of commerce and in steamship offices.

The illustration accompanying this note shows the display at Honolulu in the office of the Inter-Island Steam Navigation Company, agents for the Dollar Line at that port.

The exhibits went forth under the charge of Dr. W. J. Hanna and are being sent at the present time to Honolulu, Kobe, Shanghai, Hongkong, Manila, Singapore, and Colombo. Reports have been received from Honolulu, Kobe, Shanghai, and Manila that Dr. Hanna was given a very cordial reception and the exhibits placed prominently on display. Incidentally the exhibits will go forward in establishing profitable contact between the growers of California and the consumers of the Orient.

Exhibit of California fruit from the Sacramento Chamber of Commerce at the Honolulu office of the Dollar Line.

Petroleum imports into Canton

Items	1922	1923
[illegible]	Gallons	Gallons
[illegible]	1,502,820	5,251,005
[illegible]	6,842,200	4,766,592
[illegible]	3,674,787	2,063,291
Total	12,519,807	11,812,978
[illegible]		
[illegible]	286,454	109,360
[illegible]	17,072	81,792
Total	303,526	190,972
Lubricating oil	18,610	26,423
Fuel oil	Long tons	Long tons
	6,234	4,997

PETROLEUM MARKET OF THE CANTON DISTRICT OF CHINA

The demand for mineral oils in the Canton district of China is met entirely by imports from foreign countries, about two-thirds of the supply coming from the United States and the remainder from Borneo and Sumatra, according to Consul General Douglas Jenkins, of Canton, in Commerce Reports.

One British company and three American companies are the principal distributors of mineral oil products in the Canton district and the British company and two of the American companies handle lubricating oils as well as kerosene and gasoline. The products are sold on consignment to Chinese merchants who act as distributors in the interior. The table herewith shows the demands for the various products of petroleum.

The MARINE STORY of the Union Oil Company of California

1888 — 1925

PREPARED FOR

Pacific Marine Review

BY

CAPTAIN EDWARD BUGGE

MARINE SUPERINTENDENT

THE history of the Union Oil Company's tanker fleet dates back to the year 1888 when Lyman Stewart and W. L. Hardison, whose partnership laid the foundation for the Union, had constructed for their use the first oil tanker used on the Pacific Coast. The tanker was the W. L. Hardison, a wooden vessel with a carrying capacity of 6500 barrels—considered a huge cargo in those days. From this modest beginning, the Union's deep sea fleet has been consistently developed until its present carrying capacity, not including river barges and miscellaneous craft, approximates 1,000,000 barrels. Its field of operations extends from Alaska on the north to Chilean ports in the south, to the Hawaiian Islands on the west and to the Atlantic seaboard on the east.

Disaster early overtook the development of the fleet. Less than a year after the tanker W. L. Hardison was placed in commission, the vessel was burned to the water's edge while standing at the wharf at Ventura. The fire originated in the woodwork behind the overheated kitchen stove, and the inexperienced Chinese cook and crew, believing that oil tankers were exceedingly dangerous and liable to explode in case of fire, left the boat and let it burn. The vessel had inserted steel tanks, and the cook could have put out the fire with a bucket of water, thereby removing all danger to the crew or ship.

Captain Edward Bugge

This disaster delayed but could not stop development of the fleet, because water transportation was much more economical than railroad shipment from the then producing California oil fields to San Francisco Bay points. Rail rates which had been $1 per barrel were reduced to 50 cents per barrel with the advent of the oil tanker, a rate which was maintained for many years.

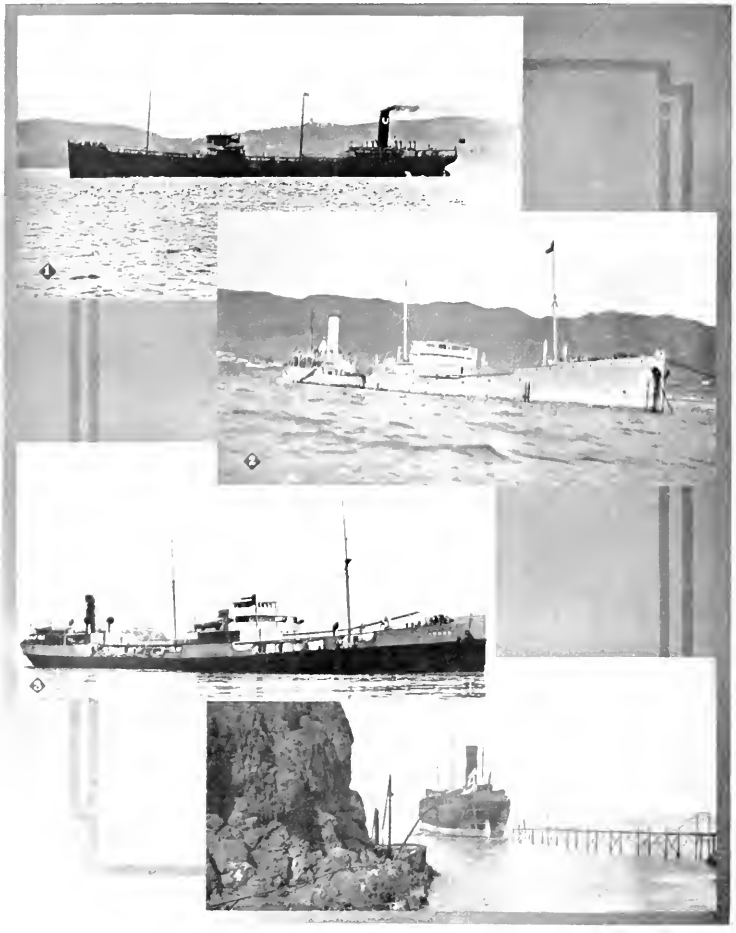
In 1900 the Union Oil Company had the barge Santa Paula constructed. It carried 8000 barrels, traveled under sail, and was the nucleus from which has grown the present fleet.

Development was consistent from this time. In 1902 the barkentine Fullerton, carrying 16,000 barrels, was built. This was followed in 1903 by the tanker Whittier, considered at the time the finest oil steamer afloat. The Whittier carried 11,000 barrels. In 1903 business in the Hawaiian Islands developed to the point where it was necessary for the Union Oil Company to make the longest tandem tow in the world, at that time. The Whittier towed the barges Santa Paula and Fullerton from San Francisco to the Hawaiian Islands and return in twenty-eight days.

By 1906 the Union Oil Company had found it necessary to secure three additional steamers—Washtenaw, Roma, and Lansing. They were followed shortly by the Argyll, giving the Union Oil five tank steamers and several barges. The Roma was later sold. While discharging oil at Galveston at the time of the flood at that port, she was swept inland for one and a half miles and it was necessary to dredge her out. The tanker Argyll was at the time of her commission the largest oil carrier on the Pacific Coast with a capacity of 28,000 barrels. In the fall of 1906 the Argyll was dispatched to Panama Balboa with the first cargo of fuel oil brought into that port for the Union Oil Company (if not the first ever brought into that port). In 1908 she was converted to carry one tank refined, thus having the honor of being the company's first light oil tanker, her capacity for refining oil being 5900 barrels. In 1920 she was sold to the Compagnie de Boleo.

In 1907 rapid sales development caused the acquisition of two more carriers, each holding 50,000 barrels. Their addition to the fleet marked a big step forward for it must be remembered that heretofore the carrying capacity of the ships had not exceeded 12,000 barrels each. In addition two steamers were chartered. At this time the marine department was shipping large amounts of fuel oil to Panama, the greatest portion of the fuel used for generating power in the digging of the canal being furnished by the Union

THE HIGH SEAS FLEET OF THE



1. Tanker Santa Maria steaming down the river Clyde, Scotland, on a trial trip. This vessel was recently changed from British to American registry, and is one of the crack ships of the Union Oil Company's fleet of tankers. 2. The tanker Coalinga discharging fuel oil at Antofagasta, Chile. Because of lack of harbor facilities on the Chile coast, the discharge of oil at Antofagasta, as at Taltal, is by means of submarine pipe lines. The procedure is relatively simple. Permanent anchorage is provided by concession from the Chilean government and indicated by buoys carrying heavy anchor chains. To these and to its anchors the tankers are made fast, and the discharge valves connected to the submarine pipe lines. 3. The Utacarbon leaving Los Angeles harbor with a cargo of crude oil, and 4, the Coalinga discharging a cargo at Taltal.

The Union's fleet carries oil to Alaskan ports in the north and as far south as Taltal, Chile. In addition a regular service is maintained with the Hawaiian Islands, where the Union operates marketing stations.

UNION OIL COMPANY OF CALIFORNIA

1. The tanker La Brea built in San Francisco by the Bethlehem Shipbuilding Corp. in 1914-1916 and placed in operation in 1916. Was converted in 1923 into a light oil carrier and has since transported several cargoes of gasoline to the Atlantic seaboard. 2. The Montebello, one of the newer types of Union Oil Company tankers, was built in 1920-1921 and is of 12,000 D. W. T. 3. Shows the La Purisima, the smaller type of Union Oil Company tanker, being of 7500 D. W. T. This vessel is used largely in the carrying of oil to ports which cannot accommodate ships of large draft. 4. The Cathwood loading oil at Ventura, California. This tanker was purchased by the Union Oil Company from the United States Shipping Board in the fall of 1922.

The Union's first tanker was built in 1888, when the W. L. Hardison, a wooden vessel, was placed in commission. Its carrying capacity was 6500 barrels. Two years later the Santa Paula, capacity 8000 barrels, was built, and from that time the development of the fleet has been consistent with the growth of the company. The present fleet, not including river barges and miscellaneous small craft, has a total carrying capacity of approximately 1,000,000 barrels.

Oil Company. Five more vessels and two barges were added to the fleet before 1914, and in that year the Union Oil Company undertook the construction of a tank vessel of its own design. It was named the Lyman Stewart, carrying crude and refined oils, its total carrying capacity being 73,000 barrels. This vessel was wrecked in a collision with the Walter Luckenbach at the entrance to the Golden Gate in 1922.

In 1916 the magnificent steamers Los Angeles and La Brea, both carrying 75,000 barrels, were constructed for the Union Oil Company by Bethlehem Shipbuilding Corporation, San Francisco.

In 1920 further expansion caused the letting of contracts for four more tankers, and these are now operating under the house flag of the company. They are the Montebello, 80,000 barrels; Santa Maria, 80,000 barrels; La Placentia, 80,000 barrels; and La Purisima, 55,000 barrels. The Santa Maria was built in Scotland, and until recently operated under British registry. A few months ago "Old Glory" replaced the Union Jack at the taffrail of this vessel.

In the past two years four vessels have been purchased from the United States Shipping Board. They are the Cathwood, Utacarbon, Deroche, and Warwick. The first three are sister ships of over 10,000 d. w. t., while the Warwick has a carrying capacity of 46,000 barrels or 6800 d. w. t.

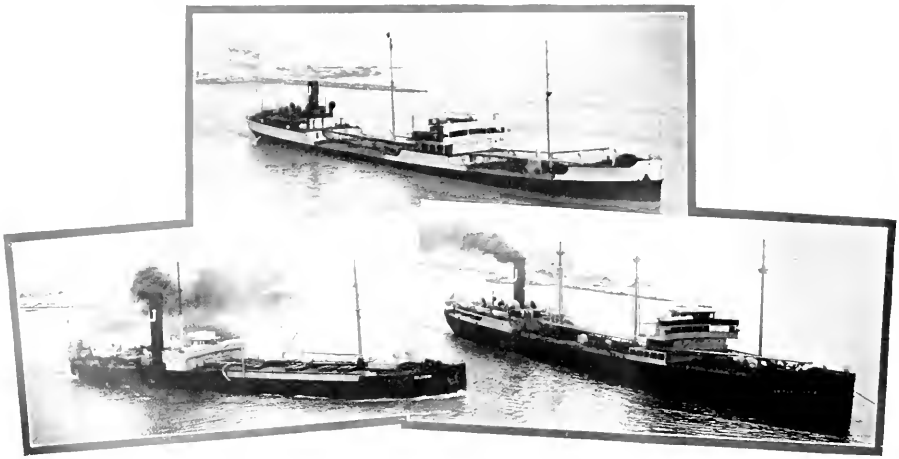
FLEET OF THE UNION OIL COMPANY OF CALIFORNIA

Crude Oil Carriers	Capacity, bbls.	bbls.
1. La Purisima (combined)	35,000	
2. Santa Maria	80,000	
3. La Placentia	80,000	
4. Montebello	80,000	
5. Coalinga	80,000	
6. Los Angeles	75,000	
7. Utacarbon	75,000	
8. Cathwood	75,000	
9. Deroche	75,000	
10. Oleum	36,000	
11. Lansing	45,000	
12. Washtenaw	25,000	
13. Erskine M. Phelps	30,000	
14. Fullerton	16,500	
		807,500
Refined Oil Carriers		
1. La Purisima (combined)	20,000	
2. La Brea	75,000	
3. Warwick	16,000	
		141,000
Capacity Barges, etc.		16,200
Total capacity		964,700

In addition to these owned tankers, the Union Oil Company has operated during the past ten years a number of chartered vessels, but all of these have since been returned to their owners.

In the operation of the company's tankers in the South American trade, there is brought to light an interesting development in the technology of petroleum distribution. That is the discharge of tankers while lying at anchor by the use of submarine lines. Here on our California coast, with our docks and wharfs protected against the storms of the Pacific by natural and artificial barriers, we see little need of such devices. But on the Chilean coast in South America, where natural harbors are few and the growth of commerce has not yet warranted the building of expensive breakwaters, the submarine line has made possible the handling of oil in bulk.

The ordinary procedure for discharging a cargo of oil at stations where submarine lines are used is relatively simple. Permanent anchorage is provided by concession from the Chilean government and indicated by buoys carrying the heavy anchor chains. To these and its own anchors the ship is made fast, so as to place its stern hard by the end of the pipe line, its head pointing out to sea. In this position the ship is



Union Oil Company tankers Deroche, Oleum and La Placentia departing from Los Angeles Harbor.

ready to drop lines and steam seaward in case of sudden storm.

Nothing has more accurately reflected the progress and development of the Union Oil Company of California during the past twenty years than the consistent growth of the marine representation of the company. Keeping pace with the great expansion along other lines, the fleet of this California organization has grown during the last two decades from one vessel with a capacity of 8000 barrels to sixteen high sea vessels excluding barges and river vessels, with a total capacity of nearly 1,000,000 barrels.

The Union Oil Company of California is one of the largest oil companies on the Pacific Coast. Organized on October 17, 1890,—although the actual formation of the company goes back to 1883 when the Hardison and Stewart partnership was formed between the two veteran Pennsylvania operators—its original capitalization was $5,000,000. By 1900 the Union Oil business had grown to such an extent that capitalization was increased to $10,000,000. Eight years later it was found that the net value of properties was much greater than the par value of the capital stock issued, and accordingly, the authorized capital was again increased, this time to $50,000,000, of which $24,000,000 was issued. In June, 1920, the capitalization was increased to $100,000,000—$50,000,000 being issued. In February, 1924, capital stock was still further increased to $125,000,000, approximately $93,000,000 being outstanding. These figures are impressive and are analogous to the development of the organization in its various branches, i. e., field, or production; transportation, by pipe line and vessel; refineries; sales, or marketing.

Largely responsible for the development of the Union Oil Company of California are the men who have fostered it from its earliest days. Chief among these was Lyman Stewart, "Father of Western Petroleum," who guided its steps for forty years, prior to his death last year. His son, W. L. Stewart, is president of the corporation. He came to California in 1883, has been associated with the oil industry ever since, and has held every executive position in the organization. E. W. Clark, the executive vice-president, came to the Union, after a long railroad career, touched with extensive oil connections. W. W. Orcutt, vice-president, has been associated with the Union since 1897. He made the first geological maps of many early California fields, and was first to organize a geological department of any western oil company. Chester W. Brown, director of exploration and production, joined the Union in 1890. L. P. St. Clair, vice-president, a prominent California oil man, was elected a director in 1919. R. D. Matthews came to the company in 1914 as comptroller. He was elected to the board of directors and executive committee the same year and is today the youngest member of both bodies. John McPeak entered the service in 1907, and was elected to his present position as secretary in 1916. R. J. Keown came to the Union in 1907, was elected treasurer in 1918, and a director this year. Paul M. Gregg joined the company as counsel in 1921. He is a native of California and has an extensive knowledge of the legal phase of the California oil industry. C. W. Ralph, director of sales and transportation has been with the company since 1914. He was appointed to his present position in 1922, and last year was elected to the directorate. Paul N. Boggs joined the company this year as assistant general manager.

Lieutenants to Mr. Ralph in the operation of the tanker fleet are William Groundwater, manager of transportation; Captain Edw. Bugge, marine superintendent, and A. O. Pegg, superintending engineer.

STEAM NOT YET DEAD

THE following remarks were made by Sir Archibald Ross, K. B. E., in the course of an address before the meeting of the Institution of Naval Architects at Wembly:

After all, the marine steam engine is far from dead. Our own Admiralty have made great advances in the use of superheat and, what is more important, the retaining of superheat at low rates of combustion. While this feature is only applicable to vessels that require long periods of steaming at powers of about one-tenth of their maximum, it is of interest as marking a distinct development and one which I ventured to mention in 1914 as a probability. There is still too big a drop in thermal efficiency between the fuel and the propeller, and to us Britishers with our natural resources of coal should fall a full measure of the honor of reducing that drop.

In these ten years we have passed through the great war. The outstanding feature from a marine engineering point of view, as far as the Navy was concerned, was the almost complete absence of any engine trouble, a phase familiar to airmen, motorists, and even the internal combustion marine engineer. Vessels of great horsepower, completed in breathless haste, were taken charge of by new complements of officers and men, and went straight into action or to an unknown destination, and did what they were designed to do, and more. This great accomplishment was due to the turbine, to gearing, and oil fuel.

It should be quite possible to improve designs so as to allow of greater flexibility in double reduction gearing, and, after all, the failures that have been so freely and, in many cases, naturally made much of, have been chiefly in connection with double reduction gears. As a steam engine the turbine is not only the most economical method of generating power for marine work, though this economy cannot be realized without affecting a reduction in revolutions at the propeller, but it is essentially suitable for passenger steamers due to the absence of vibration.

Whereas mechanical gearing has the merit of losing only 2 to 3 per cent mechanical efficiency, other methods of speed reduction have always and are today attracting serious attention, and with hydraulic transmission, advantages can be seen which, while not actually competing in efficiency with mechanical gearing, allow of the highest conditions of economy being introduced into the prime mover, such as high superheat applied to turbines revolving only in one direction, the safer adoption of end-tightening of blading, the elimination of astern units and a probable reduction in cost of manufacture. With the practicability of adopting these and other improvements associated with higher pressures, superheat, watertube boilers, mechanical stokers, highest vacuum and feed heating, one may confidently look for further economies, and, on a trial consumption of fuel per brake horsepower, be getting within measurable distance of the internal combustion engine.

THE AMERICAN CLIPPER SURPRISE

A Short Account of the Interesting Career of the First Clipper Ship Built at Boston

By F. C. MATTHEWS

THE Surprise was the first clipper ship built in Boston and was launched on October 5, 1850, from the yard of Samuel Hall. She was put afloat fully rigged, even to her three skysail yards being crossed, the occasion attracting a host of interested people, who were afterwards guests at an elaborate lunch. She was built to the order of A. A. Low & Brother, of New York, under the supervision of Captain Philip Dumaresq, a navigator of the highest reputation, who was to become her first commander.

Her dimensions were, 183:3 by 38:8 by 22 feet; 1261 tons, old measurement; 1006 tons per measurement rules effective January 1, 1865. Her dead rise was 30 inches; sheer, 30 inches and swell of sides, 9 inches. A finely carved and gilded eagle was her figurehead, while the neatly-formed round stern was ornamented with the arms of New York.

While her ends were sharp and she was lofty in her spars, she was later surpassed both in model and rig by clippers of the so-called "extreme" type whose carrying capacity was of less importance than ability to sail fast. Her main mast was 84 feet long from heel to cap; main top mast, 49 feet; top gallant mast, 28 feet; royal mast, 17 feet; skysail mast, 13 feet; she swung a 78-foot mainyard; bowsprit, 30 inches in diameter, 35 feet outboard.

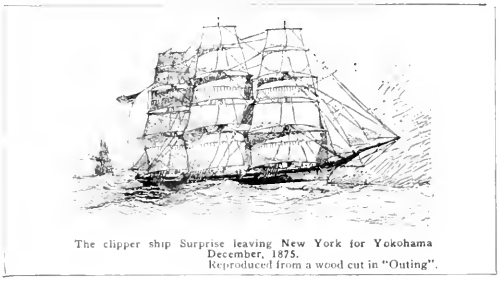
The rake of her masts was not as great as those of later clippers, being $^3/_8$, $^3/_4$ and 1 inch to the foot, respectively. The foremast was stepped 36 feet abaft the stem; the mainmast 59 feet further aft, thence 53 feet to the mizzen. Her owners were so much pleased with her that they paid her builder $2500 in excess of the contract price, besides giving a bonus to the various mechanics who had been employed on her.

The Surprise was built for the China trade, but on account of the activity in California business at the time she was launched, she was loaded for San Francisco, in part at Boston and finishing at New York, whither she proceeded in tow of the tug R. B. Forbes.

Sailing from New York December 13, 1850, she arrived at San Francisco March 19, 1851, being 96 days 15 hours from Sandy Hook to an anchorage off Clark's Point. This was one day faster than the run of the Sea Witch in 1850 and was the record until the Flying Cloud's 89-day 20-hour passage of a few months later.

She was 24 days to the line in light winds, but was up with latitude 50 south in the Pacific on the 57th day out; crossed the equator 80 days out, and then had the excellent run of 16 days 14 hours to anchorage in San Francisco Bay. She reefed topsails only twice on the passage. Total distance sailed, 16,308 miles; best day, 284 miles; poorest day, 40 miles; average, 168 miles daily.

It was stated that her manifest was 25 feet long and her freight list totaled $78,000. According to a San Francisco newspaper of that date, a merchant of that city who had a much needed consignment aboard and who had wagered a considerable sum on the ability of the Surprise to beat the time of the Sea Witch, rode to the heights above North Beach on the morning of March 19, her 96th day out, but she was not in sight. Soon after his return to his place of business, however, he was notified, to his great satisfaction, that his favorite had made good and was even then passing through the Golden Gate.



The clipper ship Surprise leaving New York for Yokohama December, 1875.
Reproduced from a wood cut in "Outing".

From San Francisco the Surprise crossed to Hongkong in ballast in 46 days, and was thence 107 days to London, having left the coast in the unfavorable season. It was stated that she obtained the high freight of 6 pounds sterling per ton of 40 cubic feet of tea, while English ships were offered under 4 pounds per 50 feet. Her earnings on this round voyage, which commenced at New York December 13, 1850, and ended at London November 12, 1851, covered her entire first cost with all operating expenses and left a profit of $50,000 to her owners.

The second voyage of the Surprise was a round trip from London to Hongkong. On the outward run she was 81 days to Anjer, beating the British clippers Stornoway and Chrysolite, but thereafter was 42 days beating up the China Sea, her total time to Hongkong being 123 days. On the return she again left the coast in the height of the unfavorable nonsoon, but made the run to the Downs in 106 days. From London she crossed to New York in 42 days, continued westerly gales prevailing.

The third and fourth outward passages of the Surprise were from New York to San Francisco, in 1853 and 1854 respectively, and both were of the same length, 118 days. Her time over the different sections of the run was as follows: To the line, 19 days 18 hours and 18 days 6 hours; to 50 degrees south, 45 days and 41 days; from 50 to 50, 24 days and 18 days; total days to the Pacific equator, 87 and 85; equator to port, 31 days (within 10 days sail of the Golden Gate for 20 days), and 33 days. These runs completed the work of the Surprise in the California trade, her average for the three trips to San Francisco being 111 days. Thereafter she was engaged entirely in operating with China and the Far East.

A record of the 14 passages she made from Asiatic ports homeward bound, between 1851 and 1866, is as follows:

When leaving the China coast during the favorable monsoon, three passages from Shanghai, in 83, 93 and 95 days respectively; two passages from Hongkong, in 86 and 108 days; one from Amoy, 91 days. When leaving during the unfavorable season, for New York

from Shanghai, 99 days; from Batavia, 89 days; from Yokohama, 138 days; two passages from Whampoa to London, in 107 and 106 days respectively. When leaving during the fairly favorable season, two passages from Shanghai in 104 and 96 days and one from Foo Chow in 96 days. Her average from Anjer to destination for the 14 runs is 81 days; fastest, 70 days; slowest, 93 days.

Some of her outward passages between the years noted were as follows: New York to Hongkong during the favorable season, 91 days; during the fairly favorable season, 106 and 109 days; during the bad season, 123 and 127 days. There were two passages to Penang, 90 and 89 days; two to Batavia, 88 and 76 days. In 1851 she passed Anjer in 81 days from London and in 1865 in 82 days from New York. In 1858, Woosung to New York, 93 days, she was up with the Cape of Good Hope when 46 days out, but then encountered heavy westerly gales and was 15 days getting around. On her 91-day passage from Amoy to New York, in 1863, she was 45 days to the Cape and crossed the equator in the Atlantic on the 69th day out.

No data that are available show any particularly noteworthy passages made during her later years, but her record as a consistently fast sailer continued through her whole career and she was always a favorite and popular vessel, as well as a money maker.

In 1867 she received extensive repairs at New York, being practically rebuilt. Her spars were reduced in size, the single topsails replaced by Howes' double topsails and the skysail yards dispensed with. Our illustration shows her just after taking her departure from Sandy Hook on the voyage which was never to be completed. Her entire complement was then 21 men, including captain and three mates. In her racing days she had 4 mates, 26 seamen, 4 boys, 2 boatswains, a carpenter, a sailmaker, 2 cooks and a steward, a total with the captain of 52 souls.

The Last Voyage of the Surprise Full of Incidents

The Surprise sailed from New York September 25, 1875, bound for Yokohama. With fair, steady winds she went off the coast under favorable conditions: on the first day out she made 240 miles and on the third day, 254. When 3 degrees north of the line she overhauled and passed two barks and a barkentine bound in the same direction. She crossed the line on the 29th day out; early that morning made out a sail ahead, also bound south, which she overtook quite rapidly and which by 2 p. m. was barely discernible astern. This was a British clipper under full sail, including mainsky sail, bound for Australia.

On the 50th day out, near the cape of Good Hope, the Surprise made 257 miles; two days later, a boy engaged in furling the mizzen royal, fell from aloft and striking the starboard boat, went overboard. The ship was making 9 knots, in a large Cape swell, which kept the decks constantly filled with water, and could not be put about. Five days later, one of the two cabin passengers died and was buried at sea. On the 61st day out she had a very heavy gale and for 36 hours was hove to under the main spenser and a goose-winged topsail, the decks being continually filled with water. On the 68th day, near the island of St. Paul, the Surprise made 315 miles, this being her best run on the passage. She was off the eastern end of Java 86 days out; two days later had a cyclone of 26 hours duration, but Captain Ranlett had previously sent down the royal and topgallant yards, and aside from the cabin being flooded, no damage was received. On the 89th day she sighted the island of Timour, off which she had a poor day's run, 24 miles. Spoke a bark which sent a boat alongside for provisions. She was 180 days out from New York, leaking, with captain sick and all of the crew down with the scurvy except the 4 men in the boat.

On the 97th day out from New York the Surprise passed through the Straits of Manepa, between New Guinea and Borneo, and ten days later was in the open Pacific, beading for Yokohama. On the night of February 3, 1876, when 130 days out, she took a pilot off the entrance to Yeddo Bay.

The Wreck of the Surprise

The following particulars incident to the loss of the Surprise are largely taken from the passenger's diary, which was published some years later.

The wind was ahead, blowing half a gale, when the pilot boarded, and short tacks were made during the night in an attempt to work into the bay. The following morning a strong gale was blowing, and as no headway was being made and the rigging suffering, it was determined to run back for shelter about ten miles, into Kabenda Bay. This necessitated rounding the Plymouth Rocks, and contrary to the judgment of Captain Ranlett, the pilot insisted on skirting these so closely that he ran the ship on the ledge.

It then became evident that he had come aboard in an intoxicated condition. His orders now became conflicting with those of the captain, all became confusion and the crew were practically demoralized. The ship heeled to port until the poop rail was within a foot of the water, when the pilot, third mate, carpenter and sailmaker left the ship in the only seaworthy boat left at the davits. The captain then also abandoned the ship in his light gig with his two best seamen, whom he had ordered to clear it away and launch. After some time the fifteen men left on board were able, with much difficulty, to launch the two heavy cutters from the stanchions across the main deck and all hands landed on the snow covered shore. They were there hospitably received by a concourse of woodcutters and were soon furnished with food and shelter. On February 7, the captain and representatives of the underwriters visited the scene of the wreck in a tug from Yokohama and found that the Surprise had been washed off the Plymouth Rocks by the heavy swell and was floating about nearly bottom up several miles from where she struck. A considerable portion of her cargo had been case oil. She proved a total loss.

Captain Dumaresq relinquished command of the Surprise in 1852 to take the new and larger extreme clipper Bald Eagle; Captain Charles A. Ranlett succeeded and was in charge for many years, after which his son, Charles A. Ranlett, Jr., had the ship until her loss.

TWELFTH ANNUAL FOREIGN TRADE CONVENTION AT SEATTLE, JUNE 24-26, 1925

The Seattle Chamber of Commerce has started making arrangements for the Twelfth Annual Foreign Trade Convention, which will be held in that city on June 24, 25 and 26, 1925. The slogan adopted for the convention is "Seattle, the Meeting Place of Occident and Orient in 1925," and business delegates from the Orient will be invited to attend.

The people of the Northwest are looking forward to receiving the members of the Foreign Trade Council and showing them the potentialities of the Northwest with relation to trade with Asia and countries of the South Pacific Ocean.

MARINE OIL ENGINE AND MOTORSHIP PROGRESS

NEW MOTORSHIPS FOR THE JOHNSON LINE

THROUGH the courtesy of Fred L. Doelker, traffic manager of W. R. Grace & Company, Pacific Marine Review is enabled to publish the plans shown on the facing page. These represent the two motorships which are being built at the Gotaverken yard at Gothenberg, Sweden, for the Pacific Coast-European trade of the Johnson Line.

It will be noted on the plans that considerable very comfortable first class passenger accommodations are provided for on these ships. The accommodations will take care of sixty-two comfortably. This innovation in Johnson Line motorships has been brought about by the demand for first class passenger accommodations from the Pacific Coast to ports of western Europe, and the number of passengers provided for is indicative of the healthy growth of passenger traffic in this trade, being largely in excess of that carried on in their ships giving direct regular schedule service on the Pacific Coast-European route.

It will be noted by those familiar with Johnson Line vessels that in these new ships the design has been changed from three mast vessels with the machinery considerably aft of the amidships to a design with two masts and the machinery practically dead amidships. It will be noted also that a funnel has been added, which in the eyes of old followers of the sea greatly improves the appearance of these vessels. A pair of short derrick posts between hatches 2 and 3 take the place of the third mast in cargo handling arrangements.

Refrigerated Space

An additional feature of great interest to Pacific Coast shippers is the large refrigerated space amidships with 62,000 cubic feet inside of insulation, 46,000 cubic feet of clear space, giving a refrigerated capacity sufficient to take care nicely of 1000 tons of refrigerated freight. In addition to this there is capacity for 6000 tons of general cargo.

The tankage capacity for oil, as shown on the plans, indicates a total of 1565 tons which would approximate a cruising radius of 25,000 miles, so that these vessels, as is the common practice with motorships, will be enabled to fuel at that point on their round trip where they can get oil at the lowest price, and it completely fueled at that point will have on each trip a large reserve, which can be pumped into the tank storage of the owners at those ports where oil is highest. Considering this feature of operation alone the motorship has a very decided advantage over the steamer.

Engines

The new motorships for the Johnson Line are to be engined with two Gotaverken Burmeister & Wain directly reversible, 6-cylinder, 4-cycle, single-acting diesel engines rated at 1750 indicated horsepower. Each of these two engines working on twin screws are designed to drive the vessel at a sea speed of 13 knots. Burmeister & Wain type diesel electric generating sets will be installed. These will be of ample capacity to take care of all heating, cooking, and lighting of the entire ship in addition to power for auxiliary machinery in the engine room and cargo handling machinery on deck.

Delivery of the first of these vessels is contracted for June, 1925, and of the second, September, 1925. It is intended by the Johnson Line to inaugurate with these vessels a definite policy for regular passenger traffic, so that passengers may be assured of all of the services which they have been accustomed to on regular passenger liners. For that purpose the crews will be enlarged, so as to include the regular complement of the ratings usually found only on first-class passenger liners.

ELECTRIC FERRIES SUCCESSFUL

RECORDS kept during the first season's run of two of the first electrically propelled ferryboats to go into service, the Hayward and San Leandro, plying across San Francisco Bay from Oakland to the metropolis, show remarkable results in traffic handled without any trouble with the propulsion machinery.

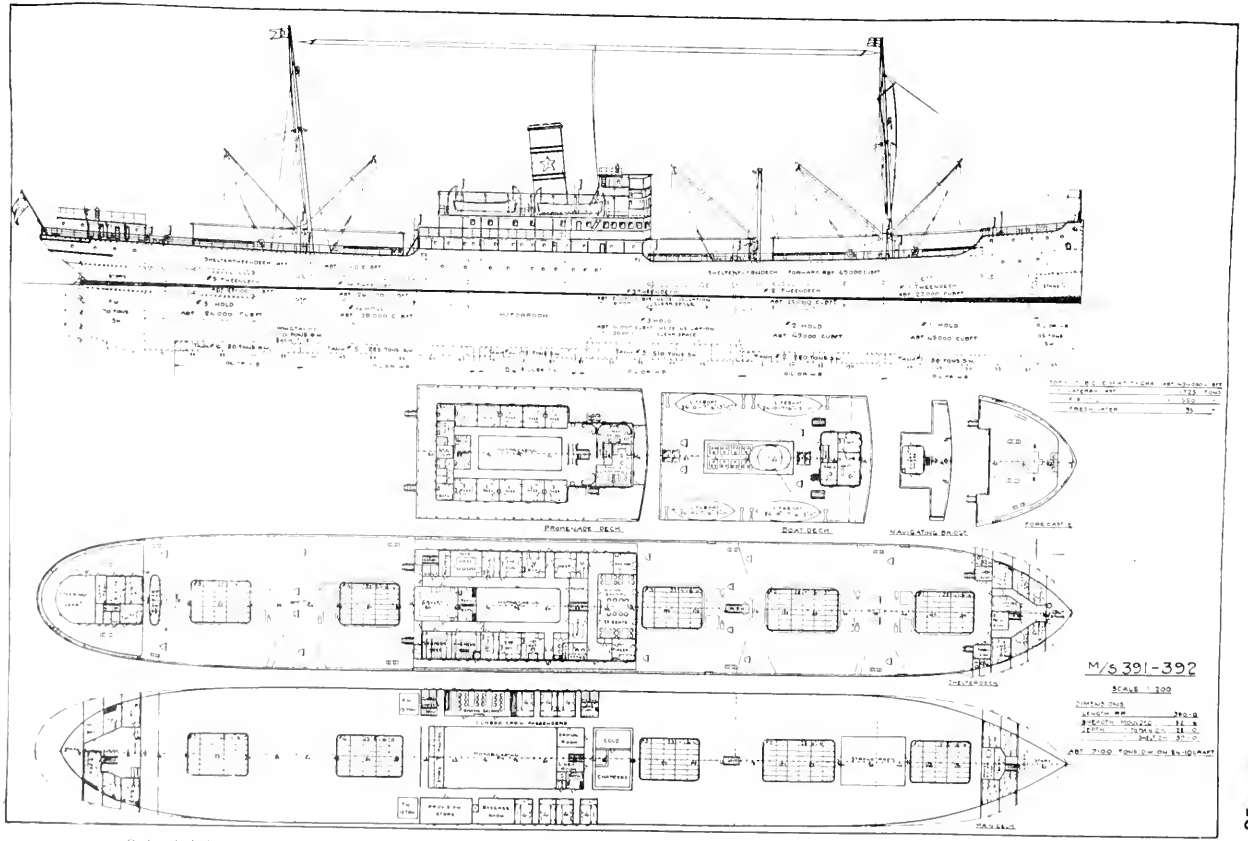
These ferryboats each carried an average of around 25,000 passengers daily. The largest daily number of passengers carried by either boat aggregated more than 30,000 persons, and between them they carried, during the season of 1923, a total of between nine and ten million persons. Throughout the season the electric drive functioned perfectly, neither of the boats having the slightest delay from this source. What this signifies can be appreciated when the terminal rush at Oakland is understood. At the Key System pier, two main tracks and eight terminal tracks bring in the trains. Every day 650 trains are moved over these tracks, and between 5 and 6 o'clock in the evening, 48 trains pass over the main tracks alone.

During one congested period, 28 trains are moved in 17 minutes, and 17 of these trains are revenue trains. This means a train every 36 seconds, and for the entire hour it means a train every 49 seconds.

Over this section of tracks there are 148 interlocking and automatic signals in 3.83 miles of double track and 45 automatic block signals on each track. The longest distance between signals is 420 feet and the shortest is 210 feet. This is believed to be one of the most densely signalled pieces of territory in existence and allows the operation of trains at a maximum speed of 35 miles an hour, 40 seconds apart.

In this system of quick transportation of rush hour crowds, the ferryboats Hayward and San Leandro have borne their full share with such success that when they were given their annual overhauling the electric propulsion machinery, built by the General Electric Company, was found to be in practically perfect condition.

Passengers on the ferryboats remarked repeatedly on the entire absence of vibration while the boats were running.



Outboard shadow profile and deck plans of the two motorships now being built at Gothenburg, Sweden, for the Pacific Coast-European trade of the Johnson Line.

THE CITY OF SAN FRANCISCO

New Motorship for the Panama Run of the Pacific Mail Steamship Company Ready to Receive Freight and Passengers

IN the July issue of Pacific Marine Review we published cut of a profile and deck plans and a full description of the new motorships City of San Francisco and City of Panama, building at Gothenburg, Sweden, for the Pacific Mail Steamship Company. As we write, the first of these motorships is approaching the city for which she is named, and is expected to be on exhibition on the San Francisco waterfront about November 1. We are glad, through the courtesy of the Pacific Mail Steamship Company, to be able to publish the photograph reprinted herewith showing an excellent view of the exterior of this vessel and several illustrations showing the passenger accommodations.

View on the bridge of the City of San Francisco looking into the enclosed navigation bridge.

These motorships have a length between perpendiculars of 300 feet and the measurements of the City of San Francisco check up for over-all length 314 feet 6 inches with a breadth of 45 feet 9 inches and a draft of 20 feet 3 inches for a deadweight tonnage capacity of 3150.

The propelling machinery consists of two sets of Burmeister & Wain directly reversible, single acting, 6-cylinder, 4-cycle, crosshead type engines, developing 1300 indicated horsepower each at 130 revolutions per minute. These engines are $23\frac{1}{4}$ inches bore by 45-7/16 inches stroke. They were designed to give a guaranteed speed of 12 knots per hour. On the official trials they exceeded this figure, driving at 12.76 knots.

All auxiliary machinery is electrically operated with the exception of an emergency air compressor, which is driven by steam supplied by a Cochran donkey boiler. This boiler also supplies steam for the galleys and for hot water and for heating the passenger accommodations.

Three generating sets of 66 kilowatts capacity, driven by two-cylinder 100 horsepower diesel engines, are installed to take care of the electric light and power requirements. For handling freight there are six 5-ton capacity electrical winches; two for each hatch. The arrangement gives four 5-ton winches grouped adjacent to the foremast and this mast is fitted with a 20-ton boom, on which all four of the winches can be concentrated to lift heavier weights.

Laurence Scott electrical steering gear manufactured by Donkin & Company is used. The electrical arrangement for controlling this steering gear is a simple adaptation of the Wheatstone Bridge principle.

A Hall refrigerating machine has been installed of sufficient capacity to take care of all the requirements of the steward's department and a small amount of refrigerated freight. For fire protection these vessels are equipped with the Rich-Lux fire detection and fire-extinguishing systems.

The first-class passenger accommodations are all located amidships on the shelter and bridge decks, the capacity being 59. The dining saloon has seats for 46 and there is in addition a veranda cafe arranged at the after end of the bridge deck.

The Gotaverken guarantee of performance was that the fuel consumption would not exceed 9 tons a day at 12 knots an hour with 2900 tons of deadweight cargo in the holds. This guarantee involved a fuel consumption not exceeding 0.33 pound per indicated horsepower per hour. On the official trial the speed guaranteed was exceeded, the general performance of the machinery was thoroughly satisfactory, and the fuel consumption was 10 per cent less than had been guaranteed.

These vessels will therefore be running on the San Francisco-Panama route with a daily fuel consumption for all purposes in the neighborhood of $8\frac{1}{2}$ tons. Figuring on this basis, steamship owners on this run will have to sharpen their pencils.

The City of San Francisco has a capacity for fuel oil in her tanks of 685 tons, which means a cruising radius of over 20,000 miles.

The City of San Francisco on her builder's trial.

ABOARD THE CITY OF SAN FRANCISCO

Upper left—Vista along the promenade deck. Upper right—Main entrance lobby. Insert—The City of San Francisco running 12 knots an hour on her official trial. Center left—A corner in the first-class lounge. Center right—One end of the smoking room. Lower left—Corridor, first-class passenger accommodations. Lower right—One of the first-class four-berth cabins.

WORLD SHIPBUILDING

DECREASES in the volume of shipbuilding in the United States and Great Britain and Ireland more than offset the gains made by other maritime countries in the last three months, so that world construction as a whole shows a decline as compared with the status at the close of June, says a statement just issued by Lloyd's Register of Shipping, dealing with the returns from all countries for the quarter ended September 30. While the decrease of work in American and British and Irish yards totaled 86,000 gross tons, that for other countries combined increased only 51,000 tons; leaving a net decrease of 35,000 tons. The comparison between the two quarters is given in the following table, the figures representing gross tons:

	Sept. 30, '24	June 30, '24
United States	64,905	103,665
Great Britain and Ireland	1,468,408	1,516,746
Other countries	1,047,699	996,486
World total	2,581,012	2,616,897

One result of the decline is that the United States, which on June 30, last, stood fifth in rank among the shipbuilding nations, is now sixth, having changed places with Holland, although the latter country is also building less than three months ago.

It is shown by the returns for the quarter just ended that the construction work being done in all countries under the supervision of Lloyd's Register of Shipping, and intended to be classed with that society, aggregates 1,684,139 gross tons, as compared with 1,641,246 tons at June 30, last. Of the present total, 1,175,503 tons represents work in the shipyards of Great Britain and Ireland. Lloyd's, therefore, is at present classifying approximately 65 per cent of the world total of tonnage under construction, and 80 per cent of the work in the shipyards of Great Britain and Ireland. The spread of the classification is also shown by the fact that whereas at June 30, last, the total of classification by Lloyd's for other countries than Great Britain and Ireland was 431,015 gross tons, it has now risen to 508,636 tons.

A most significant development in the shipping situation is the marked increase shown by the figures for the last quarter in the construction of motor vessels. The world total of ships ordered with internal combustion engines advanced more than 125,000 gross tons in the three months since June 30, last, and is now well on the way to the million ton mark. Of the entire world's shipbuilding, 36.4 per cent now consists of motor vessels, as compared with 30.9 per cent at June 30. The following table shows the comparison between the constructing of motorized ships and those with other forms of propulsion in the last two quarters, the figures being in gross tons:

	Sept. 30, '24	June 30, '24
Motor vessels	939,899	810,655
Other types	1,641,113	1,806,242
World total	2,581,012	2,616,897

The decrease in the construction of other vessels than motorships is marked, amounting to a decline of nearly 170,000 gross tons during the quarter.

An unexpected development in the situation is the increase of 60 per cent shown in the world construction of tankers of 1000 tons gross and upwards. The comparisons are as follows:

	Sept. 30, '24	June 30, '24
Great Britain	133,820	87,570
Other countries	156,400	92,600
World total	290,220	180,170

New orders being placed for tonnage show a decline from the previous quarter, while launchings during the quarter ended September 30 were in excess of the previous quarter.

The standing of the various shipbuilding countries now, compared with the June quarter, is shown in the following table of gross tonnage ordered, says Lloyd's Register:

	Sept. 30, 1924	June 30, 1924
Great Britain and Ireland	1,468,408	1,516,746
Germany and Danzig	408,617	340,749
France	137,210	144,240
Italy	132,457	127,772
Holland	88,643	96,453
United States	64,905	103,665
Japan	50,059	66,654
British Dominions	34,778	34,925

Great Britain and Ireland are now building slightly less than 57 per cent of the world's total, compared with 57 per cent at June 30; the United States, which in June had about 4 per cent of the total, is now constructing only about 2½ per cent, while the other maritime nations' share has risen from 32 per cent to about 40.5 per cent. Germany and Danzig now have about 16 per cent of the world total, as against about 13 per cent in June.

TANKER ANAHUAC BEING CONVERTED TO OIL ENGINE ELECTRIC DRIVE

THE Atlantic Refining Company of Philadelphia has awarded contract to the Bethlehem Shipbuilding Corporation for converting the steam driven tanker Anahuac to oil engine electric drive. She has an overall length of 180 feet, width 31 feet, molded depth 17 feet, and a capacity of approximately 10,000 barrels.

The new propelling machinery will consist of two 225 horsepower Ingersoll-Rand direct-injection oil engines, direct-connected to 155 kilowatt 125 volt direct current generators. Both the generators and the single 250 volt direct current propelling motor, which is rated at 375 horsepower at 120 revolutions per minute, will be furnished by the General Electric Company. This propelling equipment is similar to that installed in the Van Dyke tugs I, II and III, which were recently placed in service.

Converting the Anahuac from a steam to an oil engine electric-driven tanker will be done at the Harlan Plant of the Bethlehem Shipbuilding Corporation located at Wilmington, Delaware.

The oil engines being installed in the tanker Anahuac are of the same type as the three 840 horsepower Ingersoll-Rand direct-injection oil engines purchased by the Atlantic Refining Company for installation in the Shipping Board tanker Allentown, which will be renamed the J. W. Van Dyke.

When the work of converting both the tanker Anahuac and the tanker J. W. Van Dyke, formerly the shipping board tanker Allentown, is completed, the Atlantic Refining Company will have a fleet of five oil engine electric-driven vessels.

PACIFIC WORKBOATS AND THEIR POWER PLANTS

WORKBOAT ADVENTURE AND ROMANCE

AT first thought there could hardly be anything of a romantic nature in a workboat. However, there are many incidents arising during the operation of these prosaic craft that are of much interest, at times closely approaching what might well be called romance. For instance, a load of high explosives has to be taken to a vessel anchored near Hunters' Point. The big steamer is waiting for the cargo of potential destructiveness, and will start on her voyage as soon as it arrives and is safely stowed away in the hold.

Up toward the mouth of the Sacramento River is a barge laden with the touchy stuff, waiting for a workboat to come along and tow it to the steamer or sailing vessel that will transport it to some foreign port to be used in ripping down a mountain, blowing out the quartz rock of a mine, or perchance deepening the channel of some harbor desiring a better entrance. Or, again, the explosive may be destined to help cut a path through the high mountain of some range, so that a railroad can penetrate to rich and fertile valleys. In any of these different destinations are a wealth of incidents to happen. And even at the first move of the cargo from the wharf near Point Pinole the interest and romance commences.

The lone operator of the workboat brings his craft close to the powder barge, and as a rule he is careful not to bump too hard as he moves in. For even constant familiarity with explosives seldom makes for carelessness. Carelessness with this stuff, as a rule, happens only once. Well, the lines are fast to the workboat, she goes ahead, then stands out into the channel. Red flags denote the character of the cargo, and other vessels unanimously give her plenty of sea room. This in itself is somewhat calculated to make the workboat operator think that he is a chap of some distinction. He is, too, for close by him are tons and tons of wicked dynamite or T. N. T., which, if not handled skillfully, has the power to wreck and tear up the face of nature for miles around. The fact that one man holds this power in check, as it were, is bound to make that man feel his responsibility. As he nears the vessel for which the powder is destined, the operator must again be careful. Gingerly and neatly he lays his deadly load alongside, seeing to it that the steamer crew has soft and numerous fenders handy. When the cargo is discharged, and the return trip with the empty made, our workboat operator is a greatly relieved man, and he has again gone back to the prosaic, with nothing much to worry him but a head tide and foggy weather.

But there are other times when the workboat is romantic. Perhaps she has a party of young folks out for a fishing trip. The sea is smooth. The moonlight bathes the waters in silver. A balmy breeze blows from shore, flower-scented. Overhead a true California sky arches, its deep dark blue star-lighted by myriads of twinkling points. The old workboat is then a different thing. She becomes a place for lovers' soft nothings. The mechanical rhythm of the engines sets a lilt to a song. Someone has a concertina, and a dance is started. Youth and love join, and the everyday drab existence of the workboat becomes a poem of life.

And again, the night is dark; a swirling fog comes in from the heads; the sullen and sucking tide sweeps down the bay. It mumbles and ripples around the piers, the raucous and wailing fog sirens rend the mirk with their long-drawn-out shrieks of warning. A cold drizzle wets everything. The lights that can be seen from nearby vessels are dull and misty. They are not lights at all, only luminous spots, more like a phosphorescent glow than a real light.

There is a heavy splash, and a wild scream. Some poor devil has fallen off the wharf, and is being borne to his death by the rushing waters. He comes to the surface and yells for aid. A nearby workboat operator hears the cry. He throttles down to make as little sound as possible, and listens for the drowning man's appeal. He hears it right off his port bow. At once the diesel hursts into a roar as all power is put on. The wheel is spun over, and with body leaning far out of the wheel-house shelter, the workboat operator strives to pierce the fog and mist to sight the one he tries to save. Again the wild cry for help splits the air. This time quite near, but slightly ahead. The speed of the workboat is decreased. The operator grabs a boat-hook and, running to the bow, peers through the mirk. He sees something dark and near at hand. The boat-hook is pushed out toward the struggling man, who gasps it with the grip of despair. He is adjured to "hang on," and a coil of line is deftly thrown, settling over his shoulders. By this

(Continued on Page 585)

THE DIESEL WORKBOAT

The chuggy, chunky workboats,
Are busy night and day
Ahaulin' rafts and barges
Round San Francisco Bay.

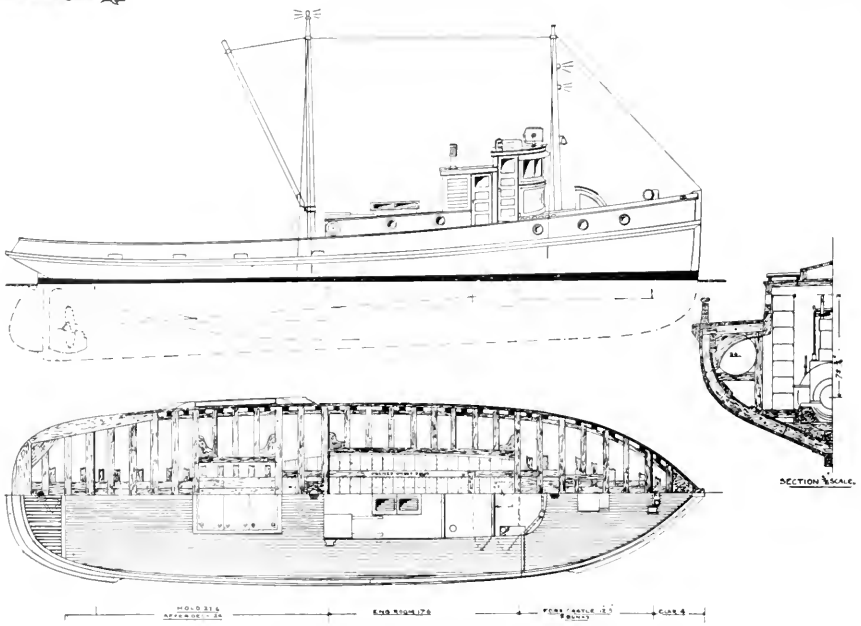
They are not so very han'some
As they scutter back and forth,
But han'some is as han'some does,
And workboats prove their worth.

A diesel's appetite is small;
The captain's all the crew;
Alone, one man can run 'em
Where a steam tug needed two.

And so they gather in the cash
When business aint so good,
Apackin' any kind o' stuff,
Hay, canteloupes, or wood.

They're hard working little duffers,
Buckin' tides and sou'west rips,
Haulin' barges, scows, and schooners
And sometimes larger ships.

And the sturdy little diesels
Seem to never stop or wait
As they churn the muddy waters
Flowing out the Golden Gate.



A Madden design for a 64-foot diesel-driven trawler.

SAUSALITO'S LEADING YARD

THE harbor of Sausalito lends itself well to the building of small craft. Sheltered from all seas its location is ideal. Timber can be carried in by rail or water. And while the water is not deep enough for heavy shipbuilding, there is ample depth for small craft. Advantage of this condition has been taken by the J. H. Madden & Company, the senior member of the firm starting a yard there some nine years ago, which has grown from a small beginning to very healthy proportions.

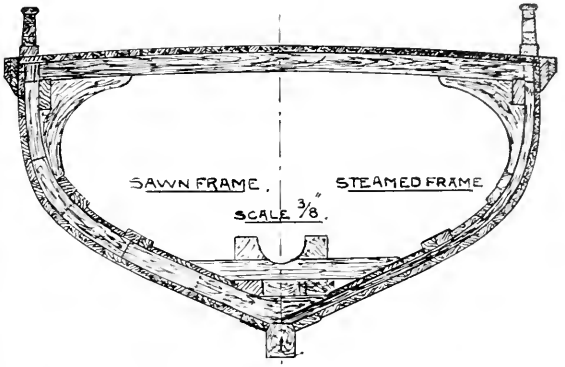
Quite a number of well-known craft have been built there, not the least famous being the Aurora, the topsail-schooner auxiliary yacht built for Cliff Durant. This boat, designed for oceon cruising, has an 80 horsepower Winton engine and a great sail spread, which can be depended on for a good turn of speed with a fair wind. She is 104 feet length, with a molded beam of 21 feet, and 12 feet depth of hold.

Keels have also been laid for two new heavy fishing boats, designed by George H. Wayland. These craft will be 45 feet in length, and 12 feet beam, and each will be fitted with a 40 horsepower Atlas-Imperial diesel. The accompanying drawings will show the general lay-out of these boats. It will be noticed that the hull timbers are heavy, and the whole design has been calculated as a unit that will stand up to all weather and hold its own against any strain of the driving diesels.

The Madden yard builds almost anything along the lines of small craft up to 112 feet in length. Skiffs, whale boats and other kinds are handled, there being permanently at the plant a staff of fine mechanics skilled in all the several operations of this type of building. Many workboats have been turned out from this yard, and have given every satisfaction to the operators. And those who go out in them say they are able and good sea boats.

One particularly difficult job has just been completed by the yard. This was the work on the hull of the four-masted topsail schooner Luzon, an account of which appears in another column. When the Madden Company, with others, figured to do the work, it was thought that quite a lengthy time on dry-dock would be necessary, as the vessel had to be reconstructed aft to carry two 110 horsepower diesels, and much strengthening and changing had to be done. It was thought that not less than twenty days on dock would be taken for the work.

However, the Madden Company planned differently. A careful survey of the Luzon was made, and while she was on the mud in the Oakland estuary sighting holes were bored through her skin aft. From these and other measurements, all the new frames were cut and bevelled, the shaft logs gotten out, and the lead sleeves fitted. Stern glands and bearings were made, struts laid out, and in fact almost every piece was ready to put in place when the vessel was finally lifted out at the Moore Dry Dock Company's plant. When dry the skin planking and after marked frames were taken



Midship section of a Madden designed hull showing the difference between sawn frame and steamed frame construction.

out, the new timbers were put in, together with the shafts and propellers, and she was only a small matter of six days on the dock when launched again all ready for the engines. It was found that the center lines of shafts were almost exact as figured, being but a fraction of an inch high, an error of no moment, but rather advantageous. A. E. Lewis, foreman and partner with the Madden Company, handled the job, together with the reconditioning and additions to the deck houses and other wood work of the Luzon. A most creditable job, and one that shows great ingenuity and resourcefulness in handling a difficult problem.

AUTO ENGINES IN POWER BOATS

ON the waterfront at Sausalito is a shop where a specialty is made of fitting automobile engines into small boats. Some of these craft are large enough to be classed as workboats, and they do a lot of towing and odd jobbing. Others, again are used as fishing boats, with an occasional "speed-burner."

William Silva, who is a skilled man with internal combustion engines, has a well laid out shop in conjunction with with the Madden yard. Here he installs engines as ordered; in new hulls or old, as the job comes along. So far he has made quite a number of such installations, and all have worked out well.

While it is nothing new to put an automobile engine into a floating chassis, it is believed this shop is the first to make a specialty of this sort of work. There are quite a number of good engines that come out of auto wrecks, which can be had cheaply. These, refitted so as to function in a boat, make an admirable power plant, if expense of fuel is not considered. That they are quick to get away and the larger units are powerful are certainties. As in most cases these engines can be purchased for much less than original cost, the overheard is light on that account.

Several of the jobs fitted up by Mr. Silva have been put in with self-starter, making them admirable where ladies are the navigators. One has been recently completed with a regular auto control, steering wheel and all, making operation similar to an automobile. By watching the market one can often obtain an engine of the same type as the family auto, and thus have duplicate plant for sea and land

(Continued from Page 583)

time the struggling man is alongside. and the husky operator, sometimes at an expenditure of strength hardly less than marvelous, drags the water-soaked one onto the deck. Occasionally "first aid" treatment has to be given to bring back to action the nearly drowned victim of the fog and water. As soon as possible, though, the workboat is headed for her float or landing place, and the wet and half-drowned man is put ashore with advice to be more careful in the future. To the thanks of the rescued one the operator usually returns a "Oh, that's nothing. Do the same for you any time," dismissing the incident with a laugh. And this may well be named romance.

A SCIENTIFIC WORKBOAT

THERE are, occasionally, men who, having a fortune, use it in the endeavor to enrich the world with knowledge. Such a man is Medford Ross Kellum, formerly a resident of Fort Myers, Florida, but who has lately become a legal resident of Honolulu. Mr. Kellum and his family and two sons, two daughters, and Mrs. Kellum made a visit to the Paradise of the Pacific some months ago, and became interested in the work of the Bishop Museum in scientific research. Finding that the Museum was restricted in its labors, due to lack of finances, Mr. Kellum arranged to supply a vessel and provide funds to enable these scientists to pursue their research work.

To make this plan a fact, Mr. Kellum purchased the four-masted topsail sailing schooner, Luzon, from Sanders & Kirchmann, a San Francisco firm who had operated her in the South Seas trade. She is of 545 tons register, 170 feet length, 36 feet 8 inches beam, and 12 feet 2 inches depth. She was built in 1900 by Hay & Wright at Alameda and is very staunch and strongly constructed; in fact, an ideal vessel for the work planned by Mr. Kellum.

J. H. Madden & Company of Sausalito took the contract to handle the reconstruction of the deckhouses and installation of the machinery, and are making a first-class job of it in every way. She is now nearly ready for trial, and will soon leave for Honolulu, where final arrangements will be made and the corps of scientists will join her.

She has been fitted with two units of 110 horsepower 4-cylinder Atlas-Imperial diesel engines. Driving twin screws, these engines will give the boat a good 10-knot speed. Beside the main engines, there is a 40 horsepower 3-cylinder diesel direct connected to a 25 kilowatt generator for auxiliary power. There is also a small gasoline-driven air compressor to ensure a reserve of starting air in the event that the supply should at any time be lost.

Fitted to be driven from each of the main units are two 12½ kilowatt direct current generators, either of which is ample in size to furnish power for the vessel's pumps, lighting, etc. So it will be seen that there are three sources of current supply, two from the main engines, and the 25 kilowatt auxiliary, any one of which can be operated independently of the others. The main engines have reversing clutches, so that with the clutches in neutral the propellers may revolve freely when the vessel is under sail. It is the intention to use her large sail area as much as possible during cruises.

There are several hoists on deck to handle sails and boats, and a special one for the anchor windlass. Any or all of these can be operated from a specially designed large storage battery of capacity sufficient to carry the load for hours without difficulty. This is an important feature of the design and is along the lines of high efficiency desired on an extended voyage like the one in prospect.

A standard naval type wireless set is also installed, of a high sending and receiving power, so that the vessel will always be in touch with the rest of the world. In fact, everything for comfort and the forwarding of the objective of the trip has been provided. Large and comfortable staterooms, messrooms, baths, laboratories, photographic room are being fitted up. The owner's quarters, together with those of the scientists, are elegantly fitted with all the modern conveniences. A refrigerating plant of most approved design is another item not to be overlooked. This will ensure fresh provisions, and preservation of scientists' specimens and samples.

Her fuel tanks have a combined capacity of 18,000 gallons of crude oil, which will give a steaming radius of some 17,000 miles, as she will consume, with both main engines running, but 11 gallons of fuel per hour. This will look small to the man who has been familiar with steam driven engines, but is a guaranteed amount. Fresh water tanks will hold 10,000 gallons, and for a crew of 16 this will be a large supply. Fresh water is always easily obtainable, in the Island part of the Pacific, and generally of very good quality.

There will be four power boats, besides two whale boats and a dingy. The power boats are to be specially constructed to meet the work to be done, as they will be used a great deal in surveying.

Ample fire protection in the way of pumps has been provided for, and in addition to those electrically connected, there will be a special pump independently driven which is of large capacity and which will handle water in bilges as well as for fire purposes. In fact, there seems to be no item overlooked which would tend to make for convenience, comfort and safety.

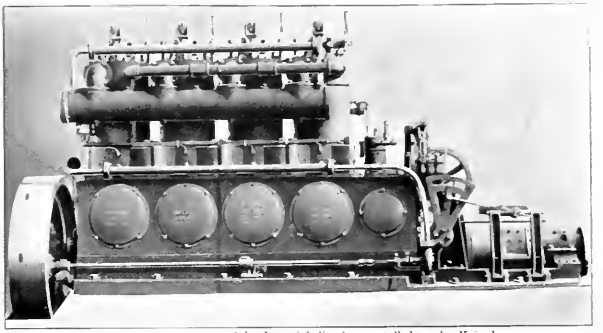
Among those who will go on the voyage of research will be specialists in ethnology, biology, oceanography, and kindred sciences. The probability that at some remote pe-

The auxiliary schooner Kaimiloa ready for her scientific exploration voyage in the South Pacific.

riod in the earth's life there was a continent of considerable extent in the Pacific, where all the smaller islands now are, will be investigated, as well as the relations between the several tribes and inhabitants of these now separated islands. Geological research will also be a feature of the expedition, as well as deep-sea soundings. The results should be of great benefit to those who go down to the sea in ships.

Captain A. E. Carter, a well known and able eastern navigator, takes command of the vessel on the voyage. He is a man of fine personality, and we predict a most pleasant cruise. The crew will be largely Pacific Islanders, who are well suited for this sort of trip.

The name of the Luzon was changed to that of Kaimiloa, this meaning in the Hawaiian language, "Wanderer or Explorer," a very fitting one for the ship.



A 4-cylinder marine type Atlas-Imperial diesel as installed in the Kaimiloa.

AN ESTUARY YARD

Panoramic view of the Bagley-Nunes boat building yard Oakland, California.

OAKLAND estuary is an ideal place for workboats. Therefore the banks of this inland harbor are dotted with large and small yards engaged in the industry of building and repairing these useful little craft. One of the oldest perhaps is the Bagley-Nunes yard at the foot of Nineteenth avenue, Oakland.

This yard claims to be the original "one-man" establishment. Any one of its employes alone can haul out or put in a small craft. Also, he can do almost any of the many kinds of work coming up in a place of this kind. In other words it is not necessary for the boat owner who wishes to have a small job done to his hull to depend on a half-dozen different mechanics. Should it be a Sunday or holiday, and he can get in touch with an employe of the Bagley-Nunes Company, the job can be done. The power for hauling the cradle is by a system of shafting so arranged that hoists can be operated, lines tautened,, etc., with only one man to handle the different levers.

While not a large establishment, the plant makes up in efficiency what it lacks in size. Mr. Bagley, the manager, has been in the small hull game for years, and is well known to workboat men and fisher folk.

As a rule some fifteen to twenty men are steadily employed, and two or three hulls are always being worked on. The largest job at present is rebuilding the steam trawler E. Antoni. Her old engines have been taken out and are to be replaced by an Enterprise diesel of 75 horsepower. The hull will also be thoroughly repaired and the deck houses remodelled. When complete the E. Antoni will be a fine addition to the Standard Fisheries fleet.

NOTES

Among the new installations of heavy-duty crude oil engines in the near future will be a 60 C-O Fairbanks-Morse engine in the Napa Transportation Company's vessel Neptune.

The Madeline, owned by the Standard Fisheries Company, is to have a 45 C-O Fairbanks-Morse engine installed. This will mean a big saving in operation.

The tug Ethel A., owned by Captain Anderson, is also to have a 45 C-O Fairbanks-Morse engine, this method of generating power having been adopted by Captain Anderson as about the best he can find for small units.

The Sacramento Transportation Company will have an 100 horsepower Fairbanks-Morse C-O engine placed in that vessel. She is exceptionally light draft and will be used mainly in river and slough work.

There is hardly a harbor in the known world where there is not a workboat. Where there are two or three ships gatnered together, there will a workboat be found. She may be small and perhaps dirty, but she will do the work needed and is reliable.

AMERICAN PORT AUTHORITIES

The Annual Convention of the American Association of Port Authorities was Held at Los Angeles, October 13th to 15th Inclusive. A Number of very Interesting Papers were Presented. We Here Abstract a Few and Shall More Fully Report on Others in a Later Issue.

PORT TERMINALS FROM A STEAMSHIP MAN'S POINT OF VIEW

By ROBERT DOLLAR

THE interests of the shipowner and port manager are so closely linked together that they are practically identical. For instance, what would be the use of docks and ports if there were no ships; or, what could ships do if they had no docks at which to discharge?

Shipowners throughout the world are fully informed of the cost at every harbor, and, everything being equal, the expensive ports get the quiet go-by. So I think it is of the greatest importance that rates should be as low as practicable. Every port on this Pacific Coast should charge the same and the rules and regulations should be as nearly uniform as possible at all ports.

I consider that some of the ports on this coast are equipped as well as any ports in the world, which should be an encouragement for all the ports to be up and doing. In striking contrast is the great seaport of New York, where the facilities are the poorest in the world, and this is aggravated by the charges being the highest in the whole world.

The port manager should therefore strive to equip the port with the best facilities obtainable for the quick handling of cargo, at the same time bearing in mind that his port charges must be kept down, for it is these two factors that determine the policy of the shipowners.

THE INFLUENCE OF PORT FACILITIES ON IMPORTS AND EXPORTS

By J. T. SAUNDERS,

Assistant Freight Traffic Manager, Southern Pacific Company, Los Angeles

BY reason of location, certain countries or communities become natural importing and exporting centers, and in such cases the port facilities themselves do not have the same force with respect to influencing imports and exports as they may have at other points not so favorably located geographically. However, the pre-eminent facilities any port can offer the shipping industry are a dominant condition of supply or demand, or preferably both.

The history of the world shows that the trade routes follow supply and demand. These are the supreme port facilities, and all others, such as slips, wharves, warehouses, belt lines, drydocks, shipyards, etc., are secondary and dependent on the supply of or demand for commodities which the port offers the world.

Three major events gave impetus to the development of Pacific Coast ports. These were the westward course of the American frontier, culminating in the gold rush of 1849 and ultimately in the completion of the transcontinental railroads; the visit of Commodore Perry to Japan and China in 1853; and the opening of the Panama Canal in 1914.

Ocean trade routes are an extension of railroad lines, and the maximum development of ocean commerce of any port is impossible without ample railroad service. The extension of a railroad to tidewater or from tidewater is to give the port its greatest facility, and a port's greatest asset is a railroad which can haul commodities at such rates as will not only earn a profit for itself, but will permit an additional water rate so that the commodity can be placed on its ultimate market at a price which will meet competition from other sources.

Every port yearns for its share of the foreign trade and coastwise trade; and all port authorities know that this trade will follow the path of least resistance—in other words, that which will incur the least expense to the final cost which must be paid by the consumer. This condition has brought the railroads to face a pressure for special rates to certain ports, and the opening of the Panama Canal, which has eliminated the disadvantage the industrial East had in comparison with Europe in reaching Pacific markets, and the railroad companies are constantly revising their tariffs so as to conform to the demands of the various ports in their efforts to build up trade.

Some years ago it was the tendency of the railroad lines to provide themselves with waterfront properties for the purpose of providing interchange facilities with ship lines. Recently, however, it has been the tendency of municipal and state authorities to place these shipside properties in the hands of public officials. Thus the waterfront properties are now to a great extent maintained by the municipalities to build up the port business for the general good of the public, thus eliminating the added cost at shipping points which would be the case under private ownership, where a profit on investments in shipside properties would have been necessary.

There is no dismissing the fact that port facilities have a large influence in attracting ocean commerce, but it must not be overlooked that the primary elements affecting exports and imports is a healthy demand and supply for commodities available in the region supporting the port, and, secondly, a system of railroad transportation which will haul the commodities to and from the waterside. Complete coordination of rail and water transportation facilities is a basic asset of the prosperous port.

MULTIPLE-STORY TRANSIT SHEDS AND WATER SIDE STORAGE

By J. WYMAN LUDLOW, M.E.,
Consulting Engineer, Los Angeles

THE question of storage of goods in any port is so inextricably connected with the question of freight rates, ship capacities, adjacent markets for goods, the need of a supply of goods as a balance-wheel to supply local demand, etc., that it would be impossible to treat this en-

tire subject in a way applicable to all ports. The writer, however, has made a careful study of this subject as relating to conditions at Los Angeles Harbor and throughout Southern California and is convinced that the two-story transit shed is warranted at the present time and that possibly in the future sheds of more than two stories in height may prove economical.

Not infrequently a ship, upon arriving, will have several thousand tons of cargo to discharge, but has no place available on account of the shed being filled with outbound cargo. This necessitates the ship mooring at some adjacent berth in order to discharge its cargo, thereafter moving to its assigned location in order to take on the assembled export cargo. The theory of the two-story sheds to remedy this condition, as worked out for Los Angeles Harbor, is for outbound cargo to be assembled on the first floor and for the ship to discharge its cargo from the ship's tackle directly upon the second floor. Of course every ship entering the port will not be fully loaded with both in and out cargo; therefore, the second story would not be needed continuously in the way mentioned and could be utilized for temporary storage of goods in transit and part of the upper story of the pier could be used for offices for the steamship companies doing business on the pier and thus be out of the way of heavier use of the first story.

The problem of permanent storage at or near the waterfront of Los Angeles harbor has not been definitely solved. Here the necessity does not exist as it does in some countries of maintaining large quantities of provisions in order to protect the commodity against possible shortage due to any cutting off of the source of supply. It was thought that with the opening of the Panama Canal wholesalers would establish stocks of general commodities in permanent warehouses which could be distributed as the demands required, but this has not been the case as yet. About ten years ago a large concrete warehouse of seven stories was built on Municipal Pier No. 1 immediately across the street from a transit shed with the idea of using this for ship-load storage and as a distributing center, but the warehouse is not being used for the class of storage originally planned and there does not seem to be an immediate prospect of wholesalers adopting the ship-load storage plan.

The advisability of the multiple-story transit shed construction must also be considered from an engineering standpoint. The question of foundation soil is a large factor as to whether permanent storage can economically be added above the transit sheds as compared with locations to the rear. While it is not difficult in ordinary sand or mud to drive sufficient piles to support a two-story transit shed, anything higher would require so many piles as to practically cover the entire surface of the ground. There are locations at Los Angeles Harbor where hardpan, mixed with laminated shale, is encountered at thirty or forty feet below the surface of the ground, which would furnish an ideal foundation for caissons or quay-wall construction. It would seem that it would be as economical to build a third and fourth on the immediate waterfront as it would be to build a multiple-story warehouse across the street to the rear and effect considerable savings through the elimination of extra trucking.

For the class of freight passing through Los Angeles Harbor it was found that two water-side tracks in front of the transit sheds and three or four depressed tracks at the rear, behind which is located a street for ready access of trucks was the most suitable layout of facilities. Owing to the heavy movement of freight from the harbor to the business section of Los Angeles some of the tracks at the rear have been paved over so as to give the trucks access to the rear platform of the transit shed, and this has caused some delay in the switching of cars and some friction between the railroad companies and the trucking companies, which will require adjustment.

Another feature that enters into the question of water-side storage is that of refrigeration or chilling. Should it be found that the second story of the transit shed, now under construction at Los Angeles, is not utilized to full capacity, it would be a simple matter to enclose a section of this upper story with proper insulation for the chilling of fruits, etc., which are being exported in increasing quantities from California.

Pacific Coast Port Notes

Seattle. The Olympic Refining Company has leased property and equipment belonging to the Port of Seattle Commission on a two-acre tract just north of the Smith Cove Terminal. The company proposes to erect an oil refining plant on this site for the purpose of handling crude oils from California and other points and to export the refined product to the Orient as well as distribute locally. An additional small pipeline to the southwest corner of Pier 41, Garfield Street Wharf, will be built from the tank facilities for the furnishing of gasoline and oil to small vessels.

The East Waterway Dock & Warehouse Company will extend its wharf 100 feet to allow more room for the berthing of vessels.

Grays Harbor. The delegation which went to Washington in August for the purpose of gaining some necessary aids to navigation at Grays Harbor, in advance of the regular budget, were successful in obtaining the promise of the Department of Commerce for the immediate installation of a fog horn at Westport, Washington, to replace one destroyed by fire last winter, placing of lights and buoys in the inner harbor, and erection of a radio fog signal within six months.

Bremerton. Plans for the fitting out pier for the Puget Sound Navy Yard, to cost when completed $1,290,000, were forwarded to Washington, D. C., on October 1 for official approval. Bids will be called for its construction about November 1. For the work $250,000 have already been appropriated by the government.

Portland. Contract for the construction of a new Ainsworth dock on the site of the present structure at the foot of Irving street, Portland, was awarded on September 24 to A. Guthrie & Company by the O.-W. R. & N. Company for about $400,000. Demolition of the present Ainsworth dock will start about November 1. The present Ainsworth dock is a historic structure, built in 1878, and although it is made of wood throughout, it has been kept in usable condition for forty-six years. It has been connected with much of Portland's early maritime history. The new dock will be of slow-burning mill construction and will be modern in construction and equipment, with a sprinkler system and marine elevators. Double tracks will be laid on the face of the dock, which will be on a level with Front street, where ample trackage exists on the inner or land side. The new dock will be operated in conjunction with the present railroad yards and

freight house, making a well situated and equipped property for handling freight and passengers.

Coos Bay. The city council of Coos Bay has approved improvements by the Port, which will consist of the building of a spur from the dock to the Southern Pacific tracks, this necessitating a 50-foot addition to the L of the port dock.

Honolulu. Work has started on the site for Pier 11. Contract for dredging the site was awarded to the Hawaiian Dredging Company on a bid of $47,412, and this firm is now removing the coral blocks which formed the old seawell of the Allen & Robinson land, now owned by the territory. Pier No. 11 will be a continuation of pier 10, and its completion will give the territory an exceptionally large area for handling shipping with wharves that are not excelled in any part of the United States. Pier 11 will cost approximately $350,000.

San Francisco. The sale of $2,000,000 worth of San Francisco harbor improvement bonds was authorized the latter part of September by Governor Richardson. The money obtained from the sale of these bonds will be used in the construction of a 600-foot pier and transit warehouse at China Basin at the foot of Second street. An expenditure of $1,000,000 has already been made on this site putting in the foundation work to support the structure. The original plan for this transit warehouse and pier called for a six-story structure, but it is probable that only two-stories will be built at the present time, provision to be made for the additional four stories at a later date.

A contract for the repaving of the Embarcadero from Folson street south to pier 46 was awarded during September to the Fay Improvement Company at an estimated cost of $116,000. Besides the repaving of the street the contract stipulates that the Embarcadero is to be reblocked and brought up to the level of Market street.

Oakland. The Western Water Front Industries Association is the name of a new organization of Oakland concerns interested in bringing about improvements on the Oakland harbor front and in the western industrial area. The program of improvements includes better sewer facilities; street work on the harbor front and adjacent land; better transportation facilities; adequate fire protection; dredging of the channel approaching the outer and inner harbors; filling in of tidelands for new industrial areas; the granting of fifty-year instead of twenty-five-year leases; and an educational advertising campaign for the harbor and its advantages.

Richmond. A survey of Richmond's harbor and its possibilities for development for commerce were surveyed by engineers during October. The survey was conducted by Major C. T. Leeds, in charge of construction of Los Angeles harbor, George Nicholson, chief engineer and executive secretary of the Port of Seattle, and Wilfred K. Barbard, one of the foremost railroad engineers of the country, who will have charge of the transportation aspects of the survey.

The survey will take in all the waterfront from Point San Pablo to Point Isabelle, approximately sixteen miles, and will include a study of street and rail facilities, a belt line railway, traffic arteries for heavy trucking, and wharf construction. On account of Richmond's proximity to the delta lands of the Sacramento and San Joaquin rivers, which produce the greatest proportion of the truck farm products of California, and the growing industries of the city, the Chamber of Commerce of Richmond are optimistic in the opinion that when the report of this survey is submitted to government engineers they will receive the cooperation of the government in the development of the harbor.

Los Angeles Harbor. Plans for a six-story municipal building to house all city offices for Los Angeles harbor are being prepared. The new structure will be located at San Pedro on the site of the old San Pedro City Hall. Funds for building, aggregating about $350,000, will be supplied by the different departments of the municipality which will share this building; namely, the harbor department, the police department, receiving hospital, fire department, health department, board of public works, and the municipal courts.

Remodeling, redecking, excavating and replacing fills at berth 90, Los Angeles Harbor, were started early in October to cost approximately $18,000.

Long Beach harbor is now open to coastwise vessels. The harbor now has a minimum depth of eighteen feet all the way from Los Angeles harbor to Long Beach. Work of dredging the channels and turning basin to forty feet is proceeding rapidly. The entrance to the harbor from the sea, as well as the main channel and the turning basin, will probably be ready for service June 1.

Santa Monica. The Los Angeles Athletic Club is planning the creation of a yacht harbor at the mouth of Topango Canyon near Santa Monica, which, if the plans are realized, will be one of the finest in the world.

San Diego. On September 10 a bond election was held at San Diego at which bonds for the following amounts and work were approved: $225,000 for completing pier No. 2 and $250,000 for dredging rock south of Market street.

The voters of Coronado also approved a bond issue for $75,000 to cover the city's share of expense of constructing a battle fleet boat landing on the ocean side of Coronado. San Diego business interest recently subscribed a like amount, and work on the project will start immediately.

Vancouver. The Panama-Pacific Grain Terminals, Ltd., will start construction of a grain elevator at Vancouver next spring to cost $750,000. The grain export business of Vancouver this year is one month in advance of last year. Over two hundred thousand bushels of grain were booked for shipment to the United Kingdom and Orient up to October 1.

The Robin Hood Mills, Ltd., announced through A. McLennan, Pacific Coast manager, that they will call for tenders for the construction of a dock and warehouse to cost about $250,000.

Dredging will be done at Vancouver east of the Lapointe Pier, contract having been awarded for the work to cost $450,000.

Prince Rupert. The Canadian Parliament recently appropriated $150,000 for preliminary surveys and construction work on the wheat elevator to be built at Prince Rupert by the Dominion Government.

Yokohama. Reconstruction of customs' sheds and quay walls in the Customs' compounds of Yokohama was started in September and will be completed in about three years. The sheds from No. 1 to No. 12 and the walls will be entirely rebuilt. Most of the sheds were destroyed by fire following the September earthquake while the walls were demolished by the earthquake itself. The reconstruction of the pier and sheds on the pier is not included in the present plan, but are in plans which will be submitted to the Diet at its next meeting. The Diet at its recent extraordinary session set aside 5,000,000 yen for this.

ABOARD THE HOTEL H. F. ALEXANDER

The Pacific Steamship Company is operating [illegible] service to passengers is arranged along the lines of the hotel H. F. Alexander, the largest and tastest [illegible] suite fireplace in the smoking room, a vista from the [illegible] the observation room, and a vista through the [illegible]

LUBRICATION ON SHIPBOARD

Smoky Exhaust on Diesel Engines—Telemotor Fluids—Compound Oils

INSTALLMENT No. 5

Question No. 27.—What causes an internal combustion engine to smoke, the lubricating oil or the fuel oil?

Answer.—Either fuel or lubricating oil will cause the exhaust to show smoke, but lubricating oil will produce a light blue colored smoke, while fuel oil gives a heavy black smoke. Smoke is the product of incomplete combustion and steps to prevent its formation should be taken.

Over lubrication can be easily remedied by cutting down on the supply. Of course, the type of engine, the method of application of the oil, and the mechanical condition of the cylinders and pistons, wear of rings and clearances, will all have to be taken into consideration.

Often to change the oil in use to a different viscosity will correct the difficulty. The selection of the proper oil is of great importance. So much depends upon the operating conditions, the mechanical arrangement and cooling method that it will be impossible to set down any hard and fast rule. Every problem of lubrication will require thought for its efficient solution. However, it is well to remember that very high viscosity oils do not always correct troubles; in fact, very heavy viscous oils are slow movers when cold and do not quickly spread over frictional surfaces when starting up. Heavy oils stay on the hot surfaces much longer than lighter viscosity oils and consequently pick up more heat to carry back to the crankcase. They deposit more carbon and the internal or kinetic friction of heavy oils means more power spent on useless friction. However, pistons which are badly worn do require an oil of heavier viscosity, which will form a seal and prevent the passage of gases past the rings into the crankcase from the combustion chamber.

Smoke from fuel is caused by the inability of the engine to entirely consume the charge delivered to the cylinders. In diesel engines a change of nozzles may correct this difficulty and in gasoline engines it is evidence of poor carburetion. When a fixed amount of fuel is delivered to an engine cylinder which has a rated speed of a predetermined number of revolutions per minute developed at full horsepower, and the engine should be slowed down by being overloaded, the charge is not completely burned and smoke will result. By raising the injection pressure, it may overcome the difficulty.

The valve setting or mechanical conditions of the valves often cause combustion difficulties. The character of the fuel used also has a great effect upon the combustion. The heavy viscous boiler oils used on large diesel engines will require preheating. Water and fuel oil will cause an engine to misfire and shoot into the muffler. This will cause smoke and muffler explosions, always tar loose accumulation of carbon and other matter and force it out the exhaust.

Question No. 28.—On the telemotor system, we used cylinder oil mixed with the regular telemotor oil on the last trip because we had not our regular telemotor oil through an accident. The deck department complained that the wheel went over hard [illegible] the steering engine acted very slowly. Could it be on account of the mixture?

Answer.—In an emergency, we have to get along with what we have at hand. In your case, you did all right, except had you substituted dynamo oil or ice machine oil for the cylinder oil the results could have been better. The principle upon which a telemotor works is that of a remote hydraulic control [illegible] the rudder or your steering engine.

The best fluid with which to fill your telemotor system would be water, except for the fact that water would freeze, which of course eliminates any possibility of hydraulic action and may wreck the telemotor. As a substitute, we use a low viscosity pale oil. The less fluid friction in your system the quicker the pressure is transferred from the pilot house to the steering engine, and hence the heavy viscous cylinder oil offers great resistance and causes the wheel to operate hard, as a great pressure is built up in the pilot house cylinders and this pressure is transmitted slowly aft owing to the fluid friction in the body of the oil itself.

Any good dynamo or motor oil or ice machine oil is a first class product for the telemotor, providing the viscosity is around 100. If you are ever caught in a similar circumstance and have no light oils available, you can cut the oil you have back with kerosene, or, in a pinch, use kerosene straight.

Question No. 29.—What is compounded oil and what kind of oils come under this heading? What are oils compounded for? Please make this clear in your answer.

Answer.—A compounded oil means a hydrocarbon or mineral oil mixed or compounded with an animal or vegetable oil. The compounded oils include steam cylinder oil, compounded marine engine oil, signal oil, thread cutting oils, etc. Oils are compounded to meet certain conditions for which straight mineral oils are not suited. A good steam cylinder oil is compounded with the best acidless tallow oil in varying amounts ranging from 3 to 10 per cent, or with lard oil or neat's foot oil in the same amounts. Cheap steam cylinder oils have degras as a substitute for tallow, lard or neat's foot oil. These compounds are employed to give saponification value to the cylinder oil in the presence of moisture in the steam. Straight mineral oils are washed off the frictional surfaces and passed out the exhaust as liquid oil in small drops. By the addition of compounds, the oil is turned from a liquid to a semi-liquid or soapy substance, which coats all surfaces and resists the washing effect of the water and makes a first class lubricant, which adds a lasting film to valve and cylinder walls.

A simple test for compounded oil is to add water to a small sample in the hand and, by mixing same, form a lather. Straight mineral oil will not mix with water. The presence of degras can always be determined by rubbing a sample vigorously between the palms of your hands and noting the offensive odor. Good tallow gives off no bad odor. In compounded marine engine oil, a varying amount of vegetable oil known as blown rape seed is added. The Navy specifications call for 10 per cent. Where water is present, this oil makes a fine creamy lather seen in your horseshoe thrust block and on the slides. The saponification of this oil is well known to all marine engineers and its value is well recognized.

Compounds are used in many other oils and if you have in mind any particular oil, drop a line to the Pacific Marine Review in question form and it will be answered through this column.

Much interest is being shown by maritime interests in this Lubrication Questionnaire. Send in your questions and problems and have them answered and solved by experts who have made a life study of lubricating oils and their application to the maritime field.

The service is free to all who will use it.

A QUESTIONNAIRE

This department of Pacific Marine Review answers all questions cure an expert answer.

In the preparation of these notes we are glad to inform our readers on lubrication aboard ship. If you have any problems along that line send them in to our Lubrication Editor and he will prepare or protha we have received assistance from consulting engineers, practical operating engineers, diesel engine manufacturers, and lubricating oil specialists.

We especially acknowledge the cooperation of the Associated Oil Company staff of lubrication and consulting engineers in the compiling of data.

MARINE INSURANCE

DEVELOPMENTS OF THE MONTH

By CHARLES F. HOWELL, Contributing Editor

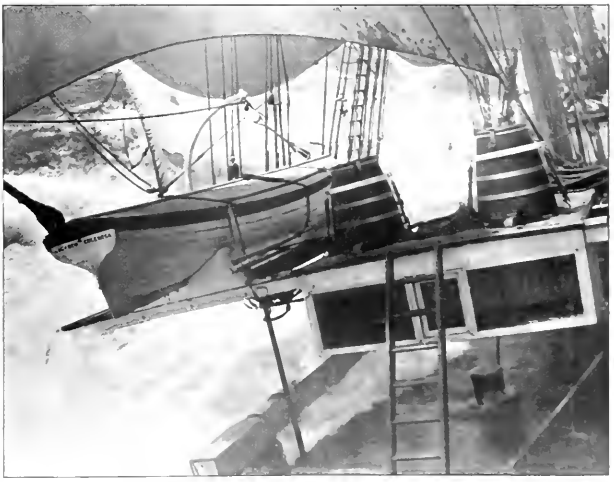
THOUGH possibly not to the general public, to marine insurance companies the outstanding event of the first month of fall was the cheering announcement from Washington to the effect that the Mixed Claims Commission had awarded to sixty-one American insurers the sum of $34,708,000 as reimbursement for war risk claims for hull and cargo damages inflicted by German submarines during the World War. This is certainly a great sum, though no more than had been anticipated by shrewd observers of the trend of Commission decisions; and yet it would be absurd for the public to leap to the conclusion that this treasure is about to be plumped into the coffers of the insurance companies named in the announcement. In the first place, the award is not due and payable until the Commission has concluded its entire work—and that will be two years from now. And then will come the arduous period of waiting for slow governmental action on Germany's part. There are insurance companies in these United States which have been patiently waiting for a century the collection of awarded claims due them from our government. The claims have long since been acknowledged to be just and proper, but Congress follows Congress without any action being taken in the matter. From such an experience as this the companies may be excused for indulging, as many of them now are, in a dubious pessimism as to whether their present officers are likely to survive the waiting period in this German award. However, Germany has obligated herself to make the payment, and the United States Alien Property Custodian is in possession of more than $10,000,000 of German equities held as security for the settlement of just such debts as this.

Another point the general public is overlooking is the fact that a very considerable portion of the award must find its way into the treasuries of the companies which carried the reinsurance on these war risk lines. It is impossible to estimate what proportion is reinsurance, because of the variation among the companies with respect to retentions. It is known, however, that the older ones wrote the lion's share of the business, and that they were not in the habit of passing out as much in reinsurance as did the younger insurers. And yet, when all has been said and done, $35,000,000 is worth picking up, even if one does not hold on to every dollar of it.

General Average Revision

When the International Law Association held its thirty-third conference at Stockholm on September 8-13 it took up the question of a revision of the old York-Antwerp Rules of 1890 with a vengeance, and went into the subject of general average without gloves. As we have previously pointed out in these columns, the York-Antwerp Rules have been subjected to severe criticism for containing no definition of general average principles and practices; and this deficiency the conference this year determined to correct, drafting six preliminary rules on the subject for submission to commercial and shipping interests. They are of a tentative nature, and should they fail of ratification the International Law Association will be asked to arrange for further consideration of the draft at a special conference. The basis of use will be that of voluntary agreement, as was the manner with the old rules.

The definition of general average



British bark Lucknow, Captain Waters, running under main top gallant sail with strong S W gale two points abaft starboard beam. Between Cape Good Hope and Australia. Lee rail under, 13 knots.

in the new draft runs to considerable detail, as follows:

A—There is a general average act when, and only when, any extraordinary sacrifice and expenditure is intentionally and reasonably made or incurred for the common safety for the purpose of preserving from peril the property involved in a common maritime adventure.

A—2—General average sacrifices and expenses shall be borne by the different contributing interests on the basis hereinafter provided.

B—Only such damage, losses or expenses which are the direct consequence of the general average act shall be allowed as general average. Damage or loss sustained by the ship or cargo through delay on the voyage and indirect loss from the same, such as demurrage and loss of market, shall not be admitted as general average.

C—Rights to contribution in general average shall not be affected though the event which gave rise to the sacrifice or expenditure may have been due to the fault of one of the parties to the adventure; but this shall not prejudice any remedies which may be open against that party for such fault.

D—The onus of proof is upon the party claiming in general average to show that the loss or expense claimed is properly allowable as general average.

E—Any extra expense incurred in place of another expense which would have been allowable as general average shall be deemed to be general average and so allowed, but only up to the amount of the general average expense avoided.

F—General average shall be adjusted as regards both loss and contribution upon the basis of values at the time and place when and where the adventure ends. This rule shall not affect the determination of the place at which the average statement is to be made up.

The original rules were revised by the conference in accordance with modern practice and six new rules were added. The first of these latter, No. 18, deals with allowances as general average for damage or loss to the ship, her machinery, or gear. No. 19 deals with undeclared or wrongfully declared cargo. It is provided that damage or loss to such cargo shall not be allowed as general average, but such goods shall remain liable to contribute if saved. Damage or loss on goods declared on shipment at less than their real value shall be contributed for at the declared value, but shall contribute at their actual value. Rule No. 20 covers expenses incurred during prolongation of a voyage occasioned by a ship entering a port or place of refuge or returning to the home port. No. 21 provides that a commission of 2 per cent shall be allowed on general average disbursements when funds are provided by the contributing interests. This is in line with American practice, although the allowance here has been 2½ per cent. No. 22 provides for interest on losses made good in general average, the rate being fixed at 5 per cent instead of the American rate of 6 per cent. Rule 23 covers the treatment of cash deposits, providing that they shall be deposited to the account of two trustees representing the shipowner and the depositors and be held as security for payment of general average, salvage or special charges. Such deposits and payments or refunds are to be without prejudice to ultimate liability of the parties.

Our "Class" in France

There has been a quiet but efficient movement this summer, on the part of American shipping authorities, to open the eyes of the French government to the unadvisableness of its ignoring our classification decisions as given out by the American Bureau of Shipping. Not long since, the French government advised that the steamer President Adams, a vessel owned by the United States government and operated by the Dollar Steamship Company, would have to go into drydock when it reached Marseilles and submit to an inspection. The President Adams carries the classification of the American Bureau of Shipping, which is recognized almost everywhere but in France, and this highhanded ignoring of our classification society did not appeal particularly to the United States Shipping Board, and it was determined by the latter that the incident should not rest.

Some time ago the French government made a ruling that ships classed in Lloyd's and the Bureau Veritas would be exempted from the annual steamship inspection; but that all other passenger vessels (not freighters), classed by other than those two societies, would be obliged to discharge and go through the tedious experience of the drydock if they intended putting into French ports. Three years ago our government took up the question of French recognition of the American Bureau of Shipping, but this was declined unless certain reciprocal arrangements were made by our government. Ordinarily American passenger ships do not enter French ports, but transfer their passengers by tenders; and this made the case of the President Adams unusual and important. The Shipping Board adopted a resolution calling the attention of the State Department to the plight of the President Adams and describing the attitude of the French government as one of "undue and unfair discrimination" in that vessels of the United States are not accorded the same treatment as tonnage under the flag of other governments. Lloyd's acceptance was held to be such a discrimination on France's part. The State Department transmitted the resolution to Ambassador Herrick, at Paris, with the request that he endeavor to secure France's recognition of the American Bureau of Shipping.

There is much secrecy over the

diplomatic moves made in this interesting affair during the past summer, but it is believed that the attention of the proper officials of the French government was directed to certain applicable features of our Merchant Shipping Act that could easily be invoked, in a reciprocal way, to the embarrassment of French vessels when in our harbors. It is whispered that there will be no further surveying of American passenger ships in French waters, as a result of this summer's campaign.

Chinese War Coverage

There has been a brisk business in war risk insurance as a consequence of the military operations in China. London has written considerable of it—quite as much as it wanted, indeed—and a few American companies have accepted this class of risks. It does not appear to have interested many of our insurers, and no decisive action was taken by the American Institute of Marine Underwriters, although a special meeting was held and the subject thoroughly discussed.

Shortly before the outbreak of hostilities Lloyd's underwriters quoted 5 per cent for two months and later the rate dropped to 1 per cent per month, covering in foreign settlements only and with the warranty of foreign ownership. At this figure, according to the latest advices from London, coverage was being effected in the foreign settlements of Peking, Tientsin, Shanghai and Hangchow, with warranty of the foreign ownership of insured property. No rates have been quoted on property of native ownership, or on property outside of the foreign settlements.

It has been learned that one Japanese company has covered the war risk on Japanese ships and merchandise to a total of 5,000,000 yen in the war areas of China, and that 2,000,000 yen more have been written by other Tokio companies.

In the New York market the rates have been remarkably low, when the intensity of the fighting is considered as well as the proximity of warehouses full of valuable merchandise. The additional charge for cover for not exceeding five days on shore in China is ⅛ per cent, and for not exceeding thirty days the rate is ¼ per cent. Coverage of goods in warehouses at Shanghai and Hankow for thirty days is being effected for 1 per cent. The risk of confiscation is being excluded in all cases. Silk is the commodity of greatest value at Shanghai.

Removes an Anomaly

There has been an effectual clearing up of a contradictory situation that readily lent itself to disputes and litigation, in the addition of the "negligence" clause to the British Institute clause for hull "total loss only" and "total loss and excesses". The "negligence" clause is a development of the "Inchmaree" clause, which received its name from that of a steamer over which a famous law suit raged, years ago, because of damages to the vessel's machinery due to the negligence of the engineer in not having opened a boiler valve. The courts held that the damage was not covered by marine insurance. The underwriters at once framed the "Inchmaree" clause in order to cover such a casualty. Additions have been made to this coverage, from time to time, so as to include damage done by loading, discharging and handling cargo, and various modifications have been introduced. The new total loss clause is identical with the ordinary text, with the exception that it is worded to cover total or constructive total loss, no mention being made of damage.

News in Eastern Offices

R. H. Pratt has been appointed to the vacancy created by the resignation, some time ago, of E. B. Proctor as insurance engineer for marine underwriters. The work of the office has to do with the cotton department of the interested companies, and it embraces the Cotton Tracing Bureau, the Port and Steamship Service, and the Compress and Warehouse Service. They classify cotton compresses, warehouses and docks and terminals where marine insurance is effected on cotton. Mr. Pratt is an experienced and able engineer and has been closely associated with Mr. Proctor in the latter's work. He was for some time on the staff of the Southeastern Underwriters' Association, and has had charge of the field work of the Bureau ever since its organization in 1916. It is felt that his appointment could not have been improved upon.

J. A. Seuberth, formerly with William H. McGee & Company, has joined the branch staff of the Philadelphia Fire & Marine at 122 William street, New York City.

William H. LaBoyteaux, president of Johnson & Higgins, has returned from two months on the Pacific Coast.

Tentative rules for building and classing steel vessels for rivers, harbors and inland waters, other than the Great Lakes, have been prepared and issued by the American Bureau of Shipping. They will be reviewed and criticised by shipowners before being finally adopted.

C. L. Goldby, vice-president and underwriter of William H. McGee & Company, returned from his two months' vacation in England at the close of October.

Ernest G. Driver, assistant secretary of the Board of Underwriters of New York, has returned from six weeks in England.

John W. Guilfoyle and Alan B. Conor, formerly with the Automobile, are now associated with John R. Crossley, Jr., under the firm name of the John R. Crossley, Jr., Company, average adjusters and insurance brokers, at 79 Wall street, New York.

Freights and Charters

October 16, 1924.

SINCE our last report, dated September 16, rates on parcels of grain by the regular steamship lines from the North Pacific and San Francisco to the United Kingdom and Continent have advanced from 35 - per ton to 40 -, and in full cargoes rates touched 40 - on wheat from the North Pacific and as high as 41/3 on barley from San Francisco. Full cargo fixtures reported are as follows: Dutch stmr. Aalsum, 34 -, option San Francisco, barley, 36 3, Oct.-Nov. loading, by Balfour, Guthrie & Co.; British stmr. Conistone, 33 -, Sept.; Norwegian stmr. Hallgrim, 30 -, by Kerr, Gifford & Co.; British stmr. Paris City, 33 -, by Wm. Pin & Co., Ltd.; British stmr. Benledi, Nov., Balfour, Guthrie & Co., terms private; Norwegian stmr. Erviken, 40 -, Oct.; Japanese stmr. Kifuki Maru, Oct., Strauss & Co., terms private; British stmr. Anglo Chilean, Nov. Strauss & Co., terms private; British stmr. Anglo Egyptian, same; British stmr. Anglo Mexican, Oct., Strauss & Co., terms private; Japanese stmr. England Maru, 38 -, Oct., Balfour, Guthrie & Co.; Japanese stmr. Kinkisan Maru, by Continental Grain Co., terms private; Japanese stmr. Meigen Maru, 39 6, Balfour, Guthrie & Co.; Norwegian stmr. Storoviken, 39 6, Oct., Balfour, Guthrie & Co.; Japanese stmr. Washington Maru, Oct., Bunge Western Grain Corp., terms private; Japanese stmr. Kobe Maru, 33 9, Oct.-Nov.; British stmr. Welsh City, 38 -, Louis Dreyfus & Co.; Japanese stmr Kifuki Maru, Oct., Strauss & Co., terms private; Japanese stmr. Italy Maru, Oct., Kerr, Gifford & Co., terms private; Japanese stmr. Pacific Maru, Oct.-Nov., Canadian Cooperative Grain Assn., terms private; British stmr. British Monarch, 36 3, Nov., option Mediterranean 2 6 extra, Richardson & Co.; British stmr. Strathlorne, San Francisco to United Kingdom, barley, 41/3, Oct., C. B. Westrope & Co.

At the present writing, full cargo rates on wheat have eased off to 36 3.

In grain to the Orient, Norwegian stmr. Hallgyn was taken from Portland by Kerr, Gifford & Co., and Japanese stmr. Meiwa Maru is reported fixed from the North Pacific to Japan at $3.95, Nov. loading.

Full cargo fixtures for lumber from the North Pacific to Australia are as follows: Japanese stmr. Manshu Maru, $10.50, J. J. Moore & Co.; Japanese stmr. Ryokai Maru, same rate, same charterers; Chilean sailing vessel Dharma, $9, W. L. Comyn & Co.; Norwegian stmr. Kalfarli, $10.50, W. L. Comyn & Co.; Japanese stmr. Ryujin Maru, $10.50, J. J. Moore & Co., Inc.; Biyo Maru by W. L. Comyn & Co., terms private; Japanese stmr. Asama Maru, $11, Dec.-Jan., by the American Trading Co., and the Japanese stmr. Ryui Maru, Nov. loading, by Balfour, Guthrie & Co., terms private; a Japanese stmr., Nov. loading, $10.50.

The Clyde Maru is reported fixed for lumber from Portland to Japan by Wilcox Hayes & Co., terms private, and the Hoki Maru for the same business by Dant & Russell, terms private.

A. C. Dutton Lumber Co. have taken Rozan Maru, British Columbia to North of Hatteras, $12, Oct. loading.

In tanker fixtures American tanker Hampton Roads is reported fixed from Los Angeles to Iquique at 55 cents per barrel, option Balboa, 35 cents; American tanker Delaware Sun, California to New Zealand, Sept. loading, 80 cents per barrel; American tanker Shreveport, San Pedro to Wellington, 79 cents, two trips, Sept. loading; American tanker Hoven, San Pedro to New York, Oct. loading, terms private, taken by the Standard Oil Co. of N. J., and the same charterers have taken American tanker Salina, San Pedro to North of Hatteras; American tanker Shreveport, California to New Zealand, Union Steamship Co.; American tanker Cecil County, San Pedro to New York, Oct. loading, Standard Oil Co. of N. J., terms private.

West Keats, U. S. Shipping Board stmr., has been sold to A. P. Hammond, terms private.

PAGE BROTHERS, Brokers.

SHIPBUILDING AND SHIP REPAIRING

The Calistoga

ON this page is shown a reproduction of the steamship Calistoga, which on October 11 went into the service of the Monticello Steamship Company, operating on San Francisco Bay between San Francisco and Vallejo.

Just five months prior to that the Calistoga, then the Florida, arrived at San Francisco from Baltimore, Maryland, in 1907. She is 298 feet long, 45 feet beam, and 16.1 feet depth, operating on a single screw with a 4-crank, triple expansion engine with 42-inch stroke. She has four single-ended Scotch boilers.

The work of reconditioning the Calistoga was conducted under the personal supervision and direction of Mr. Sutton, and consisted of an entire rebuilding of the engines and the installation of Staples and Piper oil burners and many new independent auxiliaries, including Epping-Carpenter fuel pumps and two Worthington air pumps. A complete change was made in the cabin arrangements. The 135 staterooms were taken out and the space all thrown into main cabin and social halls. The main deck is all opened for automobiles. She is equipped with barber shop, bootblack stand, soda fountain, and many other conveniences.

She had been operating for several years on Chesapeake Bay, and upon her purchase by the Monticello Steamship Company was brought to San Francisco under command of Captain C. H. Winnett and Samuel Sutton, chief engineer of the company.

Immediately upon her arrival the Florida was taken to the plant of the Monticello Steamship Company at Vallejo to be reconditioned for her new trade.

The vessel was built by the Maryland Steel Company, Sparrows Point,

Diesel Conversion Bids

Twelve manufacturers of diesel engines submitted bids to the Shipping Board for the conversion of a number of Shipping Board freighters to diesel engine propulsion. Several companies submitted bids for double acting diesel engines. The bids submitted were as follows:

Bethlehem Shipbuilding Corp., 2225 brake horsepower, single acting, $278,500—($125 a horsepower) and 10 months.

Busch-Sulzer Company, 3000 brake horsepower, single acting, $339,700—($113 a horsepower) and 14 months.

Wm. Cramp & Sons, 2500 brake horsepower, single acting, $320,000 ($128 a horsepower) and 10 months.

Falk Company, 2400 brake horsepower, single acting, $169,000 ($70 a horsepower) and 8 months.

Hooven-Owens-Rentschler, 3050 brake horsepower, double acting, $267,000 ($87.50 a horsepower) and 15 months.

McIntosh & Seymour Corp, submitted four bids as follows: 2600 brake horsepower, $290,000 ($111.50 a horsepower) and 10 months; 2350 brake horsepower, $266,000 ($113 a horsepower) and 10 months; 3450 brake horsepower, $377,780 ($109 a horsepower) and 10 months; 2700 brake horsepower, $259,600 $70 a horsepower) and 10 months; all single acting.

New London Ship & Engine Building Co., 3000 brake horsepower, double acting, $210,000 ($70 a horsepower) and 15 months.

New York Shipbuilding Corp (Werkspoor) 2432 horsepower, single acting, $225,000 ($92.50 a horsepower) and 12 months.

Nordberg Company, 3000 brake horsepower, single acting, $350,000 ($116 a horsepower) and 11 months.

Sun Shipbuilding Co. submitted two bids, one for 2500 brake horsepower, $210,000 ($84 a horsepower) and 7 months; the other for 3000 horsepower, $240,000 ($80 a horsepower) and 7 months; both single acting.

Worthington Pump & Machinery Co., 2900 brake horsepower, double acting, $243,000 ($84 a horsepower) and 9 months.

Pacific Werkspoor Diesel Engine Co. submitted two bids, one for 2585 horsepower, $206,500 ($80 a horsepower) and 8 months; the other for 2150 brake horsepower, $192,500 ($89.50 a horsepower) and 8 months; both single acting.

The American Shipbuilding Company, Cleveland, Ohio, has just issued its report for the fiscal year ending June 30, 1924.

The company completed and delivered during the year one standard bulk freight steamer and one self-unloading type of steamer, aggregating 21,954 gross tons carrying capacity, and closed a contract for one diesel drive bulk freighter. The prospects for ship building during the coming year, according to the report, are not favorable.

In closing the report M. E. Farr, president, expressed the desire to be relieved of the responsibilities of his office as manager of the company, having had thirty-two years of continuous association with the American Ship Building Company.

Work in Prospect

The contract for the construction of an express passenger liner for the Matson Navigation Company which was awarded to the William Cramp & Sons Engine Building Company by the American-Hawaiian Steamship Company has been canceled and new bids will be requested. The contract was canceled due to the revision recently made in the plans for the ship, which, it is claimed, will entail a cost of approximately $1,250,000 in addition to the $4,792,000 bid by the Wm. Cramp shipyards for the job.

The Harbor Department of the city of Los Angeles has advertised for bids for the construction of the first of two fire-boats to cost $200,000 each.

Young Bros. of Honolulu are reported to be considering the construction of a tug to haul pineapple barges between Molokai and Honolulu. Young Bros. are owners of the Mikioi, which was equipped last year at San Francisco with a 300 horsepower Fairbanks-Morse C-O engine, and the new tug will probably be larger than this.

The Standard Unit Navigation Company, St. Louis, Missouri, announced the latter part of September that it will begin operation next July of a river transportation system of 15,000 miles. Tugs built on the caterpillar principle, drawing 30 inches of water and barges drawing 12 to 48 inches will be used.

Specifications are being drawn by the Pan American Petroleum Company for more barges for harbor work similar to Pan American No. 1, which was launched October 20 by the Los Angeles Shipbuilding & Drydock Corp. The barge is 131 feet long, 51 feet beam, and 11 feet 6 inches depth, with a capacity of 7200 barrels. The barge will be propelled by Sterling engines of 750 horsepower.

The Pacific Launch & Towing Company, Vancouver, B. C., are making arrangements to add to their fleet of semi-diesel tugs.

Vancouver Harbor Commissioners are preparing plans for a new towboat 138 feet long to be powered with a 30-horsepower motor.

Recent Contracts

Kruse & Banks, Coos Bay, Oregon, were low bidders for the construction of two barges for the Army Engineer Corps, Portland district. Bid submitted was $8850 for each barge. The Marine Construction Company, Seattle, submitted a bid of $8999 for each barge; J. C. Johnson, Port Blakely $10,795; and Supple & Martin, Portland, bid $10,950 each.

J. C. Johnson, Port Blakely, Washington, has received a contract from P. E. Harris & Company, Seattle, for one cannery tender, 86 feet by 19 feet 6 inches by 10 feet. The boat was planned by L. E. Geary, naval architect, and is to be powered with a 165 horsepower Atlas-Imperial diesel engine. Keel will be laid November 3 and delivery is set for February 1.

The order held by this company for three scows for the Washington Tug & Barge Company has been increased to five scows of the same dimensions.

Nashville Bridge Company, Nashville, Tenn., has an order for a deck barge, owners not stated, 180 feet L. B. P., 36 feet beam, and 7 feet loaded draft.

Newport News Shipbuilding & Drydock Company has a contract for two freight house barges for the Chesapeake & Ohio Railway Company. These are to be 100 feet long, 30 feet beam, and 8 feet 6 inches deep; delivery next February.

New York Shipbuilding Corp., Camden, N. J., recently received an order for two carfloats for the Lehigh Valley Railroad Company. These are to have two tracks and are to be 185 feet long.

Keel Layings

Carfloat for Bush Terminal by Bethlehem Shipbuilding Corp., Sparrows Point Plant, Sept. 10.

Freight steamer, Southern Pacific Company, by Federal Shipbuilding & Drydock Company, Kearny, N. J., Sept. 22.

Oil Barge for Standard Oil Company (Ohio) by Marietta Manufacturing Company, Oct. 15.

Two maneuver boats for U. S. Government by the Charles Ward Engineering Works, Charleston, W. Va., Sept. 18 and Sept. 20.

Launchings

Sternwheel towboat, by Marietta Manufacturing Company, Oct. 21.

District of Columbia, steel combination passenger and cargo steamer, for Norfolk & Washington Steamboat Company, by the Pusey & Jones Company, Sept. 13.

Steel hull tugboat, Grace Line, Inc., by Spedden Shipbuilding Company, Oct. 10.

Deliveries

Port Costa, oil barge, Associated Oil Company, by the Moore Dry Dock Company, Sept. 23.

Carfloats, Central Railroad of New Jersey, Bethlehem Shipbuilding Corporation, Harlan Plant, Aug. 18 and Sept. 20.

Whitney, destroyer Tender No. 4, U. S. Navy, Navy Yard, Boston, Oct. 2.

Two carfloats, Boston & Ohio Railroad, Sun Shipbuilding Company, Sept. 24.

C. B. Harris, pipe line dredge, U. S. Engineers, Chas. Ward Engineering Works, Aug. 18; quarter boat, U. S. Engineers, Sept. 20.

Repair Awards

General Engineering & Drydock Co., Oakland, Calif., was low bidder recently for repairs to the double bottom of the army transport Somme, submitting a price of $8583 and 10 days. This company also submitted low bid, $7515, for repairs to the army transport Meigs.

Hanlon Drydock & Shipbuilding Co., Oakland, is performing repairs to the barge Midway of the Associated Oil Company on account of collision damage. Two other bids were submitted for this work, one by Bethlehem Shipbuilding Corp., San Francisco, $14,800 and 18 days; and Moore Dry Dock Company, $15,279 and 20 days.

Bethlehem Shipbuilding Corp. was recently awarded repairs to the Shipping Board freighter Las Vegas on a bid of $5670.35. Moore Dry Dock Company bid $5692.60.

Todd Dry Docks, Inc., Seattle, will carry out work of repairing the wreckage of the pilot house and bridge of the steamer H. F. Alexander, which was damaged by a freak wave off the Oregon Coast on October 15. Bids submitted for this work were: Todd Dry Docks, Inc., Seattle, $24,750; Moore Dry Dock Company, Oakland, $38,299; Bethlehem Shipbuilding Corp., $44,580.

Moore Dry Dock Company is engaged in repairing damage to the tanker La Brea; 20 plates will have to be repaired or renewed.

Albina Engine & Machine Works, Portland, was awarded contract on October 15 for damage repairs to the steamer Wallingford, which struck a rocky bank of the Columbia River recently. Bid submitted by the Albina Company was $9900. Other firms submitting bids were: the Commercial Iron Works, Willamette Iron & Steel Works, Portland, and Todd Dry Docks, Inc., Seattle. The latter firm submitted the lowest bid, but it was not considered, as the underwriters did not wish to send the steamer Wallingford to sea in its damaged condition.

Victoria Machinery Company, Vancouver, has received a substantial repair job in a contract for repairs to the Norwegian steamer Tatjana, which was wrecked off Barclay Sound last February and raised by the Pacific Salvage Company after having been abandoned by the underwriters. The cost will be $125,000 and the time 40 days.

Bids were opened September 25 for the conversion of the lighthouse tender Sequoia from a coal to an oil burner and were submitted to Washington for approval. Bids submitted were: Mare Island Navy Yard, $18,216 and 25 days; Hanlon Drydock Co., $15,540 and 18 days; General Engineering & Drydock Co., $26,200 and 35 days; Bethlehem Shipbuilding Corp., $27,700 and 30 days.

Shipyard News

The Port of Portland has just placed an order with the Sharples Specialty Company, San Francisco, for two No. 6 Sharples Centrifuges for handling the fuel and lubricating oil on the new diesel-electric dredge Clackamas, now building by the Port of Portland Commission at Portland, Oregon.

The former army transport Dix, now the property of the Dollar Steamship Line, is being converted to an oil burner at San Francisco by the owners. Bids were called for by the Dollar company several months ago, but they were all rejected and the work is being done by the owners.

The Crosby Marine Corporation's recently organized shipbuilding yard launched its first vessel the early part of October, when the tender S. H. Finch, built for Henry Finch, deep sea diver, was sent down the

ways. The vessel is 65 feet long, 18 feet beam, and will be equipped with a 60-horsepower Mianus diesel.

Todd Dry Docks, Inc., have completed conversion of the freighter Patterson to a diesel drive. She is equipped with a 320 horsepower Bolinder engine, which was removed from the freighter Moonlite. The engine has been practically rebuilt, a large number of new parts having been supplied by Henry Lund & Company of San Francisco, Pacific Coast agent for the Bolinder people.

The Puget Sound Navy Yard, Bremerton, Washington, is working on repairs to the Shipping Board liner President Jackson, operated by the Admiral Oriental Line.

Announcement was made during October that the California Transportation & Improvement Company, operating freight and passenger steamers on the Sacramento and San Joaquin Rivers, had been negotiating for the purchase of a block of land on Banner Island, Stockton, California, for the purpose of establishing a shipyard. This company has been planning the construction of two large river steamers for some time, and will probably start construction work on acquiring the enlarged shipyard space.

A number of diesel conversion jobs on small craft have been performed on the Pacific Coast in the last few weeks. These include the tug Tempest of the Chesley Tug & Barge Company, Seattle; other craft of this company will be converted at a later date. The Pacific Towboat Company of Seattle is rebuilding the Victor II at a cost of approximately $35,000. She will have a 125-horsepower diesel. The Crowley Shipyards, Oakland, besides converting the schooner Luzon, mentioned in a separate article in this issue, is starting work of installing diesel engines in their own launches No. 6 and No. 7. M. Fay & Sons are having a 65-foot freighter equipped with diesel engines and the Healy-Tibbitts No. 1 is also being converted to a diesel boat—she will have a 250-horsepower engine.

The Blanchard Boat Works, Seattle, is turning out some stock cruisers fully equipped with the exception of the engines, which will be installed at the buyer's option. The craft will be 36 feet long, 9 feet beam, and can accommodate engines up to 100 horsepower.

The Patterson-McDonald Shipbuilding Company, Seattle, won its suit for damages against the Commonwealth Government of Australia, as a result of withdrawal of the Australian government's appeal to the Supreme Court on a decision for damages in the sum of $1,285,000 for breach of contract in favor of the shipbuilding company, growing out of war-time construction.

Progress of Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT

Potrero Works

Purchasing Agent: O. W. Streett.

[illegible], hull 5322, cargo steamer, H[illegible] Meat Co., Honolulu, 190 LOA, [illegible] beam, [illegible] loaded draft, 12 mi speed, TE engs., 2 water tube boilers; keel [illegible]; [illegible] Sept 17 24; deliver Oct[illegible] 24, est.

El Paso, hull 532[illegible], ferry steamer, [illegible] & San Francisco Transp. Co., 224 LOA, 44 10 beam, 12 loaded draft, 12 mi speed, TE engs., 3 Scotch boilers; keel [illegible] 24; launch Oct22 24.

No name, hull 5324, ferry steamer, sister to above.

No name, hull 5325, sister to above.

Hull [illegible], [illegible] Electric tanker, Standard Oil Co. of Calif.; [illegible] LBP, [illegible] beam, [illegible] loaded [illegible] speed, [illegible] BHP [illegible] 40 HP [illegible] Works [illegible] diesel engs.

A. W. de YOUNG BOAT & SHIPBUILDING CO., INC.

Alameda, Calif

Purchasing Agent, Robt. J. O'Connor.

No. [illegible], [illegible] cutter, Coast Guard, [illegible] HP [illegible] speed [illegible] keel No[illegible] [illegible]

[illegible] Nov[illegible] 24; [illegible]

No. [illegible] Nov[illegible] 24; [illegible]

No. [illegible] Nov[illegible] 24; de[illegible]

No. [illegible] deliver Feb '25, est

No. [illegible] deliver Feb [illegible]

No. 260, hull [illegible], sister to above, deliver Feb [illegible], est

No. 261, hull [illegible], sister to [illegible], deliver Feb [illegible], est

No. 262, hull [illegible], sister to [illegible], deliver Feb [illegible], est

Pile driver, San Francisco Harbor Board, [illegible]; keel Sept[illegible] 24; deliver [illegible] 24, est.

Yuba, stag boat, U. S. Engineers; [illegible] length, 7[illegible] beam, [illegible] depth, stern wheel, [illegible] burning, accommodations for 40 crew, keel Oct[illegible] 24, est; deliver Mar1 25, est.

J. C. JOHNSON'S SHIPYARD

Port Blakely, Wn.

[illegible], Washington Tug & Barge Co., Seattle; [illegible] delivered Oct[illegible] 24, [illegible] Oct1[illegible] 24, [illegible] Oct [illegible] Nov 14 and Nov 28.

No name, [illegible], tender, P. [illegible] Harris & Co., Seattle; [illegible]x19x10; 165 HP Atlas Imperial diesel engs.; keel Nov3 24, est; deliver Feb1 25.

THE MOORE DRY DOCK CO.

Oakland, Calif.

Purchasing Agent: N. Levy.

Port Costa, hull 167, oil barge, Associated Oil Co., S. F.; 140 LBP, 30 beam; 7-6 loaded draft, Pacific diesel engs; 220 BHP; keel May12,24; launched Sept[illegible] 24; delivered Sept23 24

NAVY YARD

Puget Sound

Medusa, repair ship for government; 460 LBP, 70 beam, about 19 loaded draft; 17-5 loaded speed, turbine eng. 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan 2 20; launched Apr16 23, deliver May15 24, est.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed, turbine eng. 7000 IHP; two WT express type boilers; 10,000 tons disp; keel Apr11/21; delivery Apr1/25, est.

TODD DRYDOCK & CONSTRUCTION CORPORATION

Tacoma, Wash.

Bienville, hull 43, passenger and freight stmr, Southern Pacific Co.; 445 LOA; 57 beam; 25 loaded draft; 16 knots speed; 7000 DWT; keel Feb26 24; launched July16/24; deliver Nov/24, est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY

Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty coal barges, Carnegie Steel Co.; 175x26x11; 16 delivered.

Thirty barges, Carnegie Steel Co.; 175x26x11 ft; deliver 1924, est.

Fifteen barges, Amer. Steel & Wire Co., Pittsburgh; 100x26x9-3; deliver 1924.

Twelve barges, Tenn. Coal, Iron & R. R. Co.; 140x25x8-6; 12 launched.

Two dump scows, U. S. Engineers, Pittsburgh; 100x26x5-10; deliver Aug27/25, est.

One car transfer barge, Missouri Illinois R. R. Co.; 225x38x10; 2 track; deliver Dec1/24, est.

Three barges, Kosmos Portland Cement Co.; 175x32x8; deliver spring 1925.

THE AMERICAN SHIP BUILDING COMPANY

Lorain, Ohio

W. H. Gerhauser, vice-president and director of purchases.

No name, hull 789, freighter, Hutchison & Co., 580 LBP; 60 beam; 20 loaded draft; 13 loaded speed; 13,600 DWT; 2200 IHP TE eng; 3 Scotch boilers, 13-6; deliver Apr/25, est.

BATH IRON WORKS, LTD

Bath, Maine

Purchasing Agent: J. L. F. Burke.

No name, hull 98, passenger and freight steamer, New England Steamship Co.; 202 LBP, 36 beam, 10 loaded draft; 15 knots loaded speed, capacity 2000 passengers, 100 tons freight, one 4 cycle, TE eng, 1200 IHP; 2 B&W boilers, 4450 square feet HS; keel Oct 17 24, est, launch Apr1/25, est; deliver May 1 25, est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT

Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N.

Massachusets, hull 1400, battleship U.S.N.; to be scrapped

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT

Wilmington, Del.

Hull 3490, carfloat, C. R. R. of N. J.; 325 LBP, 38-6 beam, 1030 gross tons; keel May/24; delivered Aug18 24

Hull 3491, same as above; keel May14 24; delivered Sept20 24.

Hull 3492, carfloat, Erie Railroad; 325 LBP; 38-6 beam, 1030 gross tons; keel July12/24.

Hull 3493, carfloat, sister to above; keel July 23 24

Hull 3494, carfloat, Bush Terminal; 275x37-6 x10-3; keel June9, 24

Hull 3495, sister to above; keel Sept10 24.

BETHLEHEM SHIPBUILDING CORPORATION, SPARROWS POINT PLANT

Sparrows Point, Md.

Hull 4230, carfloat, B. & O. R. R.; 283x37-6 x9-3; keel June9 24

Hull 4231; sister to above; keel July1/24.

Hulls 4232-4233, steel dump scows, Arundel Corporation.

CLINTON SHIPBUILDING & REPAIR COMPANY

Philadelphia, Pa.

No name, hull 45, oil barge, City of Phila.; 88 LBP; 30 beam; 8 loaded draft; keel June /24, est; launch July/24, est; deliver Aug/24, est.

CONSOLIDATED SHIPBUILDING CORPORATION

Morris Heights, N. Y.

Hull 2764, 30 ft cruiser, H. W. Hanan.

Hull 2773, Exp. cruiser, Harold Vanderbilt; 46x10-6; 180 HP Speedway engs.

Hull 2774, cruiser, J. B. Ford; 85x15; 2 300-HP Speedway engs.

Hull 2775, yacht tender, A. B. Deck; 23x5-8; 25 HP Speedway eng.

Hull 2777, cruiser, M. M. Belding; 50x12; 2 M-6 Speedway engs.

Hulls 2778-9, play boats for stock; 34x8-6.

Hull 2780, steel cruiser, W. O. Briggs; 118x21; 2 180 HP Winton diesel engs.

Hull 2787, coupe yt. tender, Harry Payne Whitney, 29x7; Gold Cup Packard eng

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.
Philadelphia, Pa.

Purchasing Agent: Lt. C. Geehr.

Marblehead, hull 502, scout cruiser, U.S.N.; keel Aug4 20; launched Oct9 23; delivered Sept 5 24

Memphis, hull 503, scout cruiser, U.S.N., keel Oct4 20; launched April 24, 1923 to cost complete Oct1 24

No name, hull 509, triple screw passenger and freight steamer, Matson Navigation Co.; 572 LBP; 76 beam, 26 loaded draft; 23 knots speed; 18,000 tons displ; turboelectric engs; 20,000 SHP.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

Purchasing Agent: G. O. Williams.

C. G. hull 127 inc. 15 patrol boats for U. S. Coast Guard; 72 long, 13.6 beam; deliver first boat Oct24 24, est.

No name, hull 92, yacht for E. G. Monohan; 71 LBP, 11.8 beam, 4 loaded draft; 12 mi speed; 60 HHP gas engs; keel Nov24 24, launch Oct 30 24, est, deliver Nov17 24, est.

DRAVO CONTRACTING COMPANY
Pittsburgh, Pa.

Hulls [illegible] for Pittsburgh Coal Co.; 175 gross tons each; for U. S. Engineer Louisville Dist.

Hull 334, sand dredger, Keystone Sand & Supply Co.; 175-34-5.6 ft; 433 tons.

Hulls 335 and 336, 2 derrick boat hulls, 40x 48x5.6 ft, builder's account; 100 gross tons.

Hulls 337 to 4 steel deck barges, builder's account; 100x26x6 ft; 135 gross tons.

Hull 345, 4 sand and gravel barges, builder's account; 175-28x5.6 ft; 225 gross tons.

Hulls 24 349, [illegible] gross tons.

Hull 350 [illegible] gross tons.

Hull 352 [illegible] gross tons.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent: R. S. Pope

No name, hull 24, freight unit S type; Pacific Coast; 433 LBP; 56 beam, 29 molded depth, 14.4 loaded speed, 2000 DWT; turbine engs, 6000 IHP, 4 BSW boilers; keel Sept22 24

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent: G. [illegible]

Edward E. Brevard, hull 24, 3 stack Frankfort S. S. Co., Cleveland; 615 LOA, 600 LBP; 62 beam; 32 depth; 14.4 loaded speed; 2000 DWT; turbine engs, 6000 IHP, 4 BSW boilers; keel Sept22 24

HOWARD SHIP YARDS & DOCK COMPANY
Jeffersonville, Ind.

Purchasing Agent: [illegible]

Steel [illegible] hull

Steel [illegible] hull

Steel [illegible] Agnes Dahlia Street, Inc., New Orleans; [illegible]

No name, [illegible] above

MARIETTA MANUFACTURING CO.
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilson

No name, [illegible] launched, [illegible] 3085-24 ft; [illegible] Wheeling Steel Corp., [illegible] launched Oct2 24

No name, [illegible] launched Oct2 21

No name, [illegible] launched May 17 24

No name, [illegible] launched Oct 24

No name, [illegible] launched Oct 24

Nov15 24

MIDLAND SHIPBUILDING COMPANY, LTD.
Midland, Ontario

Purchasing Agent: [illegible]

Glenlyffe, [illegible] Lake Transp. Co.; 250 LOA, [illegible] ft; 3 Scotch boilers; [illegible] est., deliver May 1 25

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Leo E. Wiese

No name, hull 65, dredge, W. F. Hurley & Co.; 110 LBP; 30 beam, 6 loaded draft; keel July15 24, delivery Oct15 24

Hull 80, deck barge, builder's account; 100 LBP, 24 beam, 5 loaded draft, keel July1 24 launch Oct12 24, est.; hull 81, dredge boat hull, T. L. Herbert & Sons; 110 LBP, 30 beam; 6 draft; keel July20 24, launch Oct12 24, est.

No name, hull 82, barges, builder's account; 100 LBP, 24 beam, 5 loaded draft, launched Sept2 24, delivered Sept2 24

Culvert, hull 83, steamboat, U. S. Govt.; 120 LBP; 30 beam; 4 loaded draft; keel Dec1 24, est., launch Feb15 25, est., deliver Mar1 25, est.

Hull 84, barge, builder's account; 120 LBP; 30 beam; 7 loaded draft.

No name, hull 85, ferry, Bisso Ferry Co.; 140 LBP; 50 beam; 8 loaded draft; keel Oct 15 24, est., launch Dec1 24, est.; deliver Dec 15 24, est.

Hulls 86 to 89, inc., pontoons, U. S. Govt.; 46 LBP, 12 beam, 3 loaded draft, keels Sept 15 24, launch and deliver Oct 15 24, est.

Hull 90, dredge, 100 LBP, 36 beam, 7 loaded draft; keel Dec5 24, est., launch Jan15 25, est., deliver Jan15 25, est.

NAVY YARD
Boston, Mass

Whitney, destroyer tender No. 4, U.S. Navy; 460 LBP; 61 beam, 21 loaded draft; 16 knots loaded speed; 10,000 tons displ; 7000 SHP geared turbines; [illegible] 2 WT express tube boilers; keel Apr24 21, launched Oct17 23, commissioned Oct2 24

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: [illegible] Planner, 271 Broadway, New York City.

George Washington, hull 276, freight and passenger steamer, Old Dominion Steamship Co.; 378 LBP; 53 beam; 29.9 depth; speed 16 knots; 2100 DWT, Newport News Curtis turbines; 4750 SHP; 2 B&W boilers; keel Sept 23, launched Aug20 24, delivered Sept 24

Robert E. Lee, hull 277, sister to above; keel May24 24, launch Oct 24, est., deliver Jan 5 25, est.

Chickahominy, hull 278, freight and passenger steamer, Clyde S. S. Co.; 378 LBP; 54 beam, 31.6 depth, 14½ loaded speed; 2600 DWT, Newport News Curtis engs, 4200 SHP, 4 Scotch boilers; keel Nov24 24, launch Dec15 24, est., deliver Jan [illegible] est.

Seminole, hull 279, sister to above; keel Sept 24 24, launch Aug [illegible]

Newport News, hull 281, sister to above; keel Dec [illegible]

Norfolk, hull 282, sister to above; keel [illegible]

Virginia, hull 283, sister to above; keel [illegible]

Pocahontas, hull 284, sister to above; keel [illegible]

Nansemond, hull 285, sister to above; keel [illegible]

Accomac, hull 286, sister to above; keel [illegible]

Hull 287, freight steamer, [illegible] Co.; [illegible] Railroad Co., [illegible]

[illegible] keel [illegible]

Hull 294 [illegible]

Hull [illegible] keel [illegible]

Hull [illegible] keel [illegible]

[illegible] keel [illegible]

NEW YORK SHIPBUILDING CORP.
Camden, N. J.

[illegible] keel [illegible]

[illegible] four cardboat, N. Y. Car. & R. [illegible]

[illegible]

[illegible]

THE PUSEY AND JONES CO
Wilmington, Del.

Purchasing Agent: James Bradley

Dredge, Columbia, hull 46, [illegible] keel Nov18 & Washington Studs Co., Wash.; [illegible] 297.7 LBP; 71 beam; 7 loaded draft, about 3½ mi speed; [illegible] DWT, [illegible] 4 scot [illegible] engs, 2400 IHP, 4 scotch [illegible] keel May 3 24, launched Sept13 24, [illegible] Dec21 24, est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Md.

Purchasing Agent: W. J. Collins

No name, steel hull tugboat, Ogden Dock Interests; 75 LOA, [illegible] beam; 16 draft, 500 IHP; [illegible] Reed vertical engs; keel Dec15 24, launched Oct10 24, deliver Nov5 24, est.

STATEN ISLAND SHIPBUILDING COMPANY
Staten Island, N. Y.

Purchasing Agent: R. E. Miller

No name, hull 749, steel diesel-electric tug boat, Penn. R. R. Co.; 110 LBP; 24 beam; 11 loaded draft

No name, hull 750, steel diesel-electric tug boat, Atlantic Refining Co.; 94 LBP; 21 beam; 11.5 loaded draft

No name, hull 751, sister to above

No name, hull 752, sister to above.

SUN SHIPBUILDING COMPANY
Chester, Pa.

Purchasing Agent: H. W. Scott

Hull 51, carfloat, P. & O. R. R.; 285 LOA; 57.6 beam; 10.3 depth; keel July2/24; launched Sept23 24; delivered Sept24 24.

Hull 82, sister to above; keel July2/24; launched Sept23 24; delivered Sept24 24.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Lookout, hull 33, towboat, U.S. Engineers, Nashville, Tenn.; 116 ft long; 29 ft beam; 5-6 depth; 2 surface condensing tandem comp engs, 300 HP; 2 watertube boiler; coal burning; inclosed draft, keel Apr17 24

No name, hull 34, quarter boat, U. S. Engs., Huntington, W. Va.; 106 long; 26 beam; keel July15 24, launched Sept17 24; delivered Sept 20 24.

Hull 35, maneuver boat, U. S. Engineers, Huntington, W. Va.; 60 ft long; 20 ft beam; 3 ft 4 in depth, keel Sept18 24.

Hull 36, sister to above, keel Sept20 24.

Repairs

BETHLEHEM SHIPBUILDING CORPORATION, LTD., UNION PLANT
Potrero Works, San Francisco

[illegible] repairs: Samoa, Gold Shell, Engine, tanks, hull; Lady Calso, stewards); Sun (dock), Ampullana, Oxaco (dock), W. S. Porter, Bowman, Westaga (stewards). Engine, boiler and hull; dock and paint; Wm. P. Herron, Adm. Sebley. Mold, dock and paint; Virginia, Koyo, Eldorado, U. S. A. T. Somme, San Diego, Panamanian, E. P. Ripley, Melville Dollar, Shelleo, Carlo, Ma ka, Lisa Arrow, Venetia, El Capitan, R. R. Hanford, Wenatchee, Corbett, Lihue, Rio, K. R. Kingsbury. Propeller: Oleum (shaft), Lake Tahoe, R. A. Bross Co., Cloverleaf, Prosperity Co., chalets. Installing two ends: S. C. T. Dodd. Installing four ends: Point City, Galley stack, Minnesotan. Install oil burner: Korea Maru. Install switch box: Frank G. Drum. One steel mainmast: Iowan. Install three bulkheads: E. R. Reed. One crosp bulk: Elizabeth. One section storm frame: J. A. Moffett. Galk leaks: Willhide. Fifty atomizers: Pressure Heart. One gypsy head: S. C. T. Dodd. Install oil stays: M. S. Cuba. Install new clinch City of Norwich. Handwheel: Monticello, S. S. Co. Cylinders: W. S. Miller, tug Peralta, D. G. S. Scofield, Manoa. Misc. repairs: Wm. P. Herron, Balachera, Majave, W. S. Elkins, Kronsland, Howick Hall, China Arrow, Nevis, Shabonee, S. C. T. Dodd, H. M. Flagler, Gold Belmont, President Taft, F. H. Hillman, Lockwood, Otis, Navigator, Alameda, Newt Layne, Wranck, Pilot, Fred W. Weller, Geronimo, Tongking, Iowa, Rotarian, Glendale, [illegible] Mooney, Portland, Sonoma, E. B. Stetson, Lone Jack, Point Montara, Virginia, Ventura, La Rue, Alice M. S. Charlie Watson, Calistoga, Steel Dredge, Steel tug No. 1, Steel Scientist, [illegible] Madison, Horace Luckenbach, President Lincoln, Point Hall. One telescopic tank; [illegible] Stevens. Dock and paint: F. H. Hillman.

COLLINGWOOD SHIPBUILDING COMPANY
Collingwood, Ontario

[illegible] repairs, tail shaft and hub [illegible] tug Wahcondah. Bottom repairs: Glenorchy.

LOS ANGELES SHIPBUILDING & DRYDOCK CORPORATION
San Pedro, California

Dock clean and paint, misc.: El Abeto, Gulfwing (gyro). Oleum (engine repairs), Ventura, Excelsior (extensive engine repairs), Lurline, Tongking, yacht Malolo, rudder [illegible], Artisan, engine repairs; dredge Seattle, Lake Arrow, Agwipotel (diamond), dredge Mc[illegible] H. M. Strong, San Fiorinto, launch [illegible], El Capitan, Vegan (caulk seams, renew [illegible] and stringer. Misc. boiler; dredge Seattle, Fred L. Doherty, Jr., West Jester (caulk et. Make and install water chest and condenser head; Lake Washington, Calypso, Fireboat [illegible] engine; [illegible] F. B. Protector, [illegible] boom; Steel Worker. Make 2 cast [illegible] Westlake. Install new pump: La [illegible] Misc.: Kathwood, W. S. Porter, City of Los Angeles, Los Angeles, Dillworth, Shabonee, La Fortuna, Yaquis, Seaward, Wm. Rockefeller, United Dredge No. 2, Ernest H. Meyers, Sea Lion, Willhide, Dixie Arrow, Barge No. 7, Standard Oil Barge No. 5, tug Peacock, Tejon, Loma, Wm. D. Warden, Vancolite.

NAVY YARD
Bremerton, Wash.

Misc. repairs and docking: Maryland, Farragut. Inst refrigerating plant: Gold Star. Misc. repairs: Henshaw, McCawley. Turbine repairs and docking: Wm. Jones, Meyer. Misc. repairs and install to operation as district craft: Mahoney, Tatnuck, Swallow, Iroquois, Pawtucket, Satsuma (also docking).

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

FOAMITE PROTECTION ABOARD SHIP

CHAS. CORY & SON, INC.'s new Catalog-Bulletin No. 26-29-A, entitled "Foamite Protection" for ships at sea and dock and all marine properties, is perhaps one of the most complete expositions of marine fire-fighting methods that has yet been published. While, of course, practically all of the more important steamship lines and industrial groups that have marine affiliations are already Foamite - protected, this new Cory catalog will be of unusual interest to marine owners and operators whether they are familiar with Foamite protection or not, and will also give interesting information to dock and terminal companies.

New Foamite Model V. S. chemical engine especially designed for marine use.

The bulletin opens with a most interesting statement by Franklin G. Wright, inspector in charge of the Bureau of Storage Liquids, Commonwealth of Massachusetts. Mr. Wright's statement is a typical valuation of Foamite equipment. It follows:

"My interest in Foamite protection, you can rest assured, will remain at its present intensity as long as your good work is continued. As a man who has followed the sea, it seemed almost impossible to secure adequate protection against fire, but after having witnessed demonstrations of Foamite equipment, it seems almost like a benediction to men endangered by fire on vessels, as well as those on shore.

"I make this statement as an ex-inspector of steam vessels for the Department of Commerce, where I had ample opportunity to become fully aware of all conditions that pertain to fire hazards at sea."

Among the interesting articles in this bulletin are the following:

The Terrible Toll of Fire at Sea.
Marine Fire-Fighting Methods.
Foamite Protection Conquers Burning Oil.
The Foamite - Protection System for All Marine Risks.
Tankers.
Boiler Rooms.
Piers and Docks.
Some of the Actual Fires That Have Demonstrated the Value of Foamite Protection.
Official Rating of Foamite Protection by U. S. Steamboat Inspection Service, National Fire Protection Association, and British Board of Trade.

The bulletin also contains interesting description of the new Foamite model VS chemical engine which was designed especially to meet a demand for Foamite protection for marine use where the size of the risk or other factors do not warrant the installation of a more comprehensive fire protection system.

The new Foamite chemical engine is apparently to be classed as first aid protection against incipient fires or in an emergency. Altogether this new chemical engine gives a restricted area fire protection service that is more comprehensive than any other device that has yet been brought out.

Chas. Cory & Son, Inc., 183 Varick street, New York, are distributing their Foamite-Protection Bulletin No. 26-29-A upon request.

"METAL MIKE" ACTIVITIES

THE Sperry gyro-pilot, familiarly known to seamen as "Metal Mike" (automatic steering device), is steadily becoming popular as a quartermaster. The tireless precision with which he steers a ship and the obedience for which he has become famous throughout twenty-four hours of service each day are making him the ideal man at the wheel.

The following ships have become shipmates with "Metal Mike" during the last six weeks:

Steamers W. D. Anderson, Herbert L. Pratt, W. M. Burton of the Atlantic Refining Company; steamers President Jackson and President Jefferson of the Admiral-Oriental Line; steamer Empress of France of the Canadian Pacific Steamships, Ltd.; steamers President Taft and President Wilson of the Pacific Mail Steamship Company; steamers P. Q. Barstow, W. C. Teagle, F. W. Weller, W. G. Warden, Livingston Roe, H. H. Rogers, Chas. Pratt, James McGee of the Standard Oil Company (New Jersey); George Washington of the United States Lines; steamer Wandsworth of the Vacuum Oil Company, Ltd.; and the steamer Birkenhead of the Vacuum Oil Company.

Oxweld Acetylene Company, Long Island City, Chicago, and San Francisco, have just published a new 48-page catalog illustrating and describing in detail its extensive line of acetylene generators and oxy-acetylene welding, cutting, brazing, lead burning, heating, and decarbonizing apparatus.

The booklet is profusely illustrated with cuts and diagrams of the various parts and equipment, which make up the Oxweld units.

NEW HOME FOR BEAUDRY HAMMERS

THE Beaudry Company, Inc., have recently occupied and are now operating a new factory at Everett, Massachusetts. Located on the Revere Beach Parkway, the plant is within three miles of the business center of Boston and it is served by a side track which means direct loadings to all points west, south and north and also a direct connection through the Union Freight Railroad with all the trans-Atlantic and coastwise shipping out of Boston harbor.

The plant is served by a private heating power unit equipped with the latest oil burning devices and capable of generating 300 horsepower.

The main building is 140 feet by 70 feet, of concrete and steel sash construction. The center bay has about 30 feet of head room and is served by an electric traveling crane. The side bays are somewhat lower and have a balcony for lighter machine work and storage, giving a total floor area of about 16,000 feet.

In the center on the first floor is the engineering and drafting department and men's dressing room and on the second floor the general offices. The building is sprinkled throughout.

The equipment is modern and up-to-date. Among the heavier pieces might be mentioned a 60-inch Gray planer with four heads and a 14-foot bed; a 72-inch Niles vertical boring mill; and in addition the usual run of lathes, smaller planers, milling machines, shapers, etc.

The tools are arranged so that the rough materials are taken in at one end and travel progressively through the shop to the other end where the finished machines are assembled, tested, weighed, skidded or boxed, after which they are picked up by the crane and placed on a loading platform which has been erected on a level with the freight car door, and loaded.

The Beaudry Company, Inc., was established in 1880 and manufactures four types of Beaudry power hammers in a variety of sizes. In addition to these they are now prepared to furnish plain or special dies for every forging purpose and for any make or size of hammer.

The company's regular product is the Beaudry Utility hammer, an inexpensive machine for service in small shops, in sizes from 25 to 100 pounds, the Beaudry Champion hammer in sizes up to 500 pounds, the Beaudry Air-cushioned helve in sizes up to 200 pounds, and the Beaudry Up-right air in sizes up to 1200 pounds weight of ram. All of these machines may be operated by a belt from an over-head shaft or by a direct connected electric motor.

The new factory of the Beaudry Company, Inc., at Everett, Massachusetts.

A New Western Combination Air Starting Unit

A NEW improved air compressor set, especially suitable as an air starting unit for larger gas and oil engines, has recently been developed and put on the market by the Western Machinery Company of Los Angeles.

This Type CE unit consists of a vertical 4-inch by $3\frac{1}{4}$-inch air compressor driven by a 4-inch by $5\frac{1}{2}$-inch vertical gasoline engine. Both pistons are connected to the same crank shaft, which gives a very compact and flexible unit. The air compressor valves are light steel discs, permitting the set to run up to 1000 revolutions per minute, although the normal speed is about 600 revolutions per minute. It requires only 15 to 17 minutes to pump up to 150 pounds per square inch an air tank of 24 inches diameter by 60 inches high, sufficient to start a 160 horsepower gas engine. However, this compressor set can pump air up to 225 pounds.

The main bearings are provided with high grade babbitt bushings, easily exchangeable, although the exceptionally large working surfaces reduce the wear to a minimum.

The lubricating system of the main bearings, piston, wrist pins, cam shaft bearings and cam gears is of the splash type, simple but effective and reliable. Ignition is produced by a high tension magneto direct driven by the crank shaft. A very efficient water cooling is effected by a small plunger pump, actuated by a bronze eccentric from the cam shaft.

The Western Machinery Company has sales and service branches at Tulsa and Okmulgee, Oklahoma, Bakersfield and San Francisco, California.

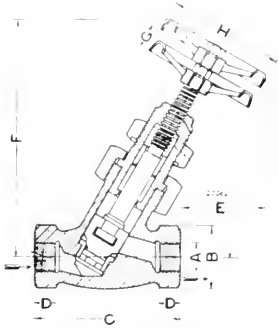
NEW FIRM FORMED FOR EXCLUSIVE DIESEL AND OTHER OIL ENGINE REPRESENSTATION

The organization of the United Diesel Engineering Company, with offices at 208 Cole building, 443 S. San Pedro street, Los Angeles, has been completed. The president of the firm is Harry W. Driggs, well known oil man throughout the United States, and its consulting engineer is Julius Rosbloom, recognized authority on diesel machinery and author of well known books.

This company is perhaps the only firm along the Pacific Coast specializing in oil engines exclusively.

INDICATOR VALVES FOR DIESELS

THE illustration shows a sectional drawing of a new forged steel stop valve recently placed on the market by Schutte & Koerting of Philadelphia. This valve is, by reason of its design and construction, peculiarly adapted to be used for indicator connections on the cylinders of diesel engines.



The bodies are of special forged steel designed for a working pressure of 650 pounds to the square inch. The valve and seat are monel metal fitted, and the seat disc and spindle are of non-corrosive material. The spindle screw is outside the gland, insuring greater ease of action and longer useful life of valve.

The inclination of the valve stem at 30 degrees of the vertical is that which has been found most convenient and practical for attachment to the great majority of types and sizes of diesel engine cylinders.

Dimensions and clearances can be obtained from the table herewith.

FIG. 8301
DIMENSION LIST OF FORGED STEEL STOP VALVES WITH INCLINED SPINDLE.

PIPE TAP A	B	C	D	E	F	G	H	DWG. No.	B. & M
3/8"	1 31/32"	4"	5/8"	2 5/16"	6 5/8"	5/8"	3"		15-V
1/2"	1 21/32"	4"	5/8"	2 5/16"	6 5/8"	9/16"	3"		1 V
3/4"	1 7/8"	4 1/2"	7/8"	2 3/8"	7 5/8"	3/8"	3 1/2"	G-6956	12V-11V-18V2
1"	2 5/16"	6"	1"	3 1/16"	9 1/4"	7/8"	4 1/4"	G7609	10V
1 1/4"	2 15/16"	6 3/4"	1 1/16"	3 1/4"	10 1/4"	1 1/16"	4 3/4"	F2199	8V
1 1/2"	3 5/16"	7 1/2"	1 1/8"	3 3/4"	11 3/4"	1 3/8"	5 1/4"	F2200	6V
2"	3 7/8"	9 3/8"	1 1/8"	3 5/8"	12 7/8"	1 9/16"	6"		2V

At left—sectional drawing of the new Schutte and Koerting valve for indicator connections on diesel engine cylinders. Above—table dimensions of valve.

Painting the Merchant Marine

ONE of the most important elements in steamship management is maintenance, and maintenance of the structure of the hull itself is dependent on paint more than on any other one factor. Under the caption, "Four Million Tons and More Each Year," the Federal Composition & Paint Company, Inc., New York, are issuing an interesting broadside, in which they call special attention to the increasing use of their products on board the ships of the world's merchant marine.

As this broadside states, a roster of the ships which sail on bottoms painted with Federal bottom compositions and of those which shine with fresh coats of Federal topside, deck, and center paints reads like a directory of shipping.

For more than thirty years the Federal Composition & Paint Company, Inc., has specialized in marine paints to the exclusion of everything else, and during this long experience, the company has evolved formulas and methods of making marine paints, which are peculiarly their own and which are consistently of a very high quality, so that the Federal product has come to be recognized among marine standards the world over.

Book Reviews

Increasing Human Efficiency in Business, by Walter Dill Scott; published by the MacMillan Company, New York; price $2.25.

This is a new edition of the standard work by this author, in which a new chapter on personnel in industry has been added. The scheme of the work considers, in successive chapters, the various factors by which human efficiency may be increased, as imitation, competition, loyalty, concentration, wages, and pleasure. The text is written in a very interesting and popular fashion and is replete with examples of the methods used by various business houses, many of which are suggestibly very valuable. The book is calculated to make the reader think out problems for himself.

* * *

Financing Exports and Imports, by Allan B. Cook. 218 pages, bound in cloth; published by The Ronald Press Company, New York; price $2.50.

Allan B. Cook is the assistant secretary of the Asia Banking Corporation and was formerly with the Export Corporation of the Willys Overland Company and a lecturer in foreign exchange at the New York University School of Commerce.

This book, Financing of Exports and Imports, analyzes the various methods of foreign trade financing and illustrates them with an abundance of practical detail. Of particular usefulness is the discussion of the method of eliminating exchange risk by the purchase or sale of future exchange. The various channels by which the government assists in foreign trade are also discussed, as well as the Edge Law banks and trade organizations in the foreign field.

* * *

Superheated Steam for River Boats is the title of Bulletin M-7 recently published by the Superheater Company of New York and Chicago, manufacturers of Elesco superheaters.

The difference between superheated and saturated steam and why the former will do more work than the latter is fully explained in this booklet and illustrated with diagrams and figures from tests showing the amounts of steam and coal required to develop the same power.

The various parts of Elesco superheaters are described and illustrated and there are paragraphs on soot blowers for flamebed type superheaters, proper lubrication and metallic packing, and points about the operation of river boat superheaters.

The booklet contains a number of layouts of Elesco superheater river boat installations and pictures of Mississippi and Ohio river boats with this equipment, as well as indicator card anid test data from river steamboats.

PERSONAL PARAGRAPHS AND ITEMS OF INTEREST

RICHFIELD gasoline, famous throughout the United States for its speed and power and holder of most of the important speedway records for the past four years, will be available to motorists in the San Francisco Bay district by the latter part of October or the first of November.

The Richfield Oil Company has announced a program of distribution in Northern California and has secured an eight-acre site on the Oakland front with deep water and car loading facilities, where they will start construction of a completely equipped distribution station.

The initial investment will represent an expenditure of around a quarter of a million dollars, which will cover general offices, an administration building, garages, repair shops, with warehouse for unloading and storage facilities in excess of 100,000 barrels. Temporary storage and loading will be cared for with two 20,000 and two 10,000 barrel tanks construction of which is now under way.

The company will have an adequate fleet of the most modern oil trucks to care for the independent service station business upon which it is their plan to concentrate.

The general layout covers loading and storage facilities, a warehouse on their own spur tracks and facilities for handling lubricating oil in bulk and putting up in drums. Work on the permanent structures will be commenced within thirty days and should be completed within the next three months. This construction will be under the direction of Harry Carr, chief engineer, and C. L. Shaffer, chief draftsman for the company. The district manager of the Oakland division is to be C. W. Cumbers, former manager of the Pasadena territory for his company, who will have under him a force or twenty or more men and at the present time both H. K. Bachelder and E. A. Troth of the Los Angeles district are in Oakland in the interests of the company.

Richfield gasoline has hitherto been obtainable only as far as Stockton and Modesto and has enjoyed a tremendous popularity wherever sold and is an example of a high quality product backed by consistent advertising and a liberal dealer policy.

VIRGINIA DOLLAR

The steamer Virginia Dollar, oldest of the British flag vessels owned by the Dollar Steamship Line, has been sold to Italian shipbreakers. The price was not announced. This leaves the dollar Line with four foreign flag ships. The Virginia Dollar is now at Genoa.

Joins western staff

J. D. MEREEN

Western Engineering Company, with headquarters in the Matson building, San Francisco, announces the appointment of J. D. Mereen as sales engineer. Mr. Mereen has had wide experience in the engineering field. After courses in mining and mechanical engineering at the Universities of Michigan and Stanford, he served for a year in Central America; had seven years as an electrical engineer for the Coos Bay Lumber Company, in charge of the steam electric power plants furnishing electric power to public utilities of the Coos Bay district; and for six years was a sales engineer and connected with manufacturing firms in the San Francisco district. Western Engineering Company manufactures the Hickman air separator and has agencies in New York, Baltimore, Cleveland, New Orleans, and Seattle. The company is district representative for the Kingsbury Machine Works, Warren Steam Pump Company, Davis Engineering Corporation, and the Diamond Power Specialty Corporation.

POSITION REPORTS

Arthur Isbell, manager of the Radio Corporation of America, advises Pacific Coast officials that a motion sponsored by the Radio Corporation to continue the free handling of ship position reports was carried at the radio conference in Washington, D. C. This will insure the continuance of this important service, which is of value to many departments of the shipping industry.

PORT EXPERTS

Sessions of the thirteenth annual convention of the American Association of Port Authorities closed recently in Los Angeles with the reelection of J. H. Walsh, New Orleans, as president for the ensuing year. The 1925 meeting will be held in New York. Officers for the coming year, all reelected, are: Tiley H. McChesney, secretary, New Orleans; F. C. Marron, treasurer, Seattle; J. Spencer Smith, first vice-president, Tenafly, New Jersey; G. B. Hegardt, Portland, Oregon, second vice-president; and Brigadier General T. L. Tremblay, Quebec, third vice-president. The executive committee reelected consisted of M. P. Fennell, Montreal; Benjamin Thompson, Tampa, and B. F. Williams, Boston.

PACIFIC MARINE REVIEW'S
INTERCOASTAL-OFFSHORE-COASTWISE
DIRECTORY
LINES SERVING PACIFIC COAST PORTS

INTERCOASTAL

SAN FRANCISCO

AMERICAN-HAWAIIAN S. S. CO.
J. R. Fitzgerald, agent.
215 Market street. Phone Douglas 9560.
FREIGHT ONLY
SAILINGS—Weekly from Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Astoria, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vanvouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore and Portland Me.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Garfield 4300.
PASSENGERS AND FREIGHT.
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles, and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between San Francisco, Seattle, Vancouver, B. C., Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

GARLAND STEAMSHIP CORP.
General Steamship Corp., agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between San Francisco, Seattle, and Los Angeles and Norfolk, Baltimore, and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc
201 California street. Phone Douglas 7600.
FREIGHT ONLY.
SAILINGS—North Atlantic - Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles, to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 21 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Co., Pacific Coast agts.
215 Market street. Phone Kearny 5100
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma; monthly to Jacksonville, Fla.

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight.
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls, New York, Baltimore, Norfolk, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Manzanillo, Los Angeles, and San Francisco.
SAILINGS—Direct Freight Service.
Every 7 days. Eastward calls: San Francisco, Los Angeles. Westward: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARRIBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Offices: 460 Market street. Phone Douglas 8680.
Freight and Operating Offices: Pacific Steamship Co., 60 California St. Phone Sutter 7800.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
W. D. Benson, Pac. Coast Mgr.,
311 California street. Phone Garfield 6760.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED AMERICAN LINES, INC.
Sudden & Christenson, Pacific Coast Agents.
230 California street. Phone Garfield 2846.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
A. F. Zipf, Pacific Coast manager.
110 California street. Phone Douglas 1670.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego and New York, Philadelphia, Norfolk and Baltimore.

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Dearborn, agent.
Mutual Life Building.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Astoria, Oakland, San Francisco, Los Angeles to New York, Philadelphia, Baltimore, Norfolk, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Manzanillo, Los Angeles, and San Francisco.
SAILINGS—Every 21 days from Portland, Astoria, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Every 10 days between Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.

DOLLAR STEAMSHIP LINE
Admiral Oriental Line, agent.
400 L. C. Smith Building. Phone Elliott 1074.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Los Angeles, San Francisco, Vancouver, New York, Boston, Baltimore, Philadelphia, Norfolk and Portland, Me.

COLONEL MORROW RESIGNS

Colonel Jay J. Morrow, Governor of the Panama Canal, has tendered to the President, through the Secretary of War, his resignation as governor, and it has been accepted effective October 15. Following Governor Morrow's recommendation, seconded by Secretary Weeks, the President has appointed Colonel M. L. Walker, Corps of Engineers, U. S. Army, to succeed Governor Morrow.

Colonel Morrow has been connected with the canal from June, 1915, to the present time, except for a period of less than two years during the World War, when he was in active service with the Army in France as chief engineer, First Army, and deputy chief engineer, A. E. F. He served with the canal as engineer of Maintenance from 1915 to 1917 and from 1919 to 1921, and succeeded General Chester Harding as governor at the expiration of the latter's term, in March, 1921.

Governor Morrow states that his resignation is submitted five months in advance of the expiration of the term for purely personal reasons. He has been desirous of entering private engineering work for some months, and in August, 1922, prepared the way for such practice by transferring to the retired list of the Army at his own request. The present time is opportune for the change and Secretary Weeks agreed to the change being made at the date mentioned.

Colonel Meriwether L. Walker, the new governor, has been engineer of maintenance of the canal since June, 1921. He has had a long and distinguished service in the Corps of Engineers, U. S. Army, since his graduation from the Military Academy in 1893.

Colonel Harry Burgess, Corps of Engineers, has been designated for duty under the governor of the canal, and will take the place of Colonel Walker as engineer of maintenance.

INTERCOASTAL

GARLAND STEAMSHIP CORP.
General Steamship Corporation, agents.
Colman Building. Phone Elliott 3706.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Seattle, San Francisco, Los Angeles and Norfolk, Baltimore, and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
L. C. Smith Building. Phone Elliott 1206.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 21 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
Pier 6. Phone Elliott 5367.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco, Portland, Tacoma and Seattle; monthly to Jacksonville, Fla.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
Lobby 4 Central. Phone Elliott 6383.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Office, 619 Second avenue.
Pacific Steamship Company, agents.
L. C. Smith Building. Phone Elliott 2068.
SAILINGS—Intercoastal.
Regular intervals between New York, San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
Transmarine Corporation.
4421 White Building. Phone Elliott 6127.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED-AMERICAN LINES, INC.
Sudden & Christenson, agents.
Arctic Club Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company, Inc.
Spokane street terminal. Phone Elliott 6637.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, and New York, Philadelphia, Norfolk and Baltimore.

LOS ANGELES

AMERICAN-HAWAIIAN S. S. CO.
T. A. Hooper, agent.
Transportation Bldg. Phone [illegible]
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Astoria, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Astoria, Seattle, Tacoma, Oakland, San Francisco and Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks from Vancouver, Seattle, Portland, San Francisco and Los Angeles to New York, Boston, Providence, Philadelphia, Baltimore and Peoria, Ill., Me.

DOLLAR STEAMSHIP LINE
212 Mortgage Guarantee Bldg., 626 So. Spring St. Phone 874-891.
PASSENGERS AND FREIGHT
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Havana, Los Angeles and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Sailings between Los Angeles, San Francisco, Seattle, Vancouver, B. C., New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

GARLAND STEAMSHIP CORP.
General Steamship Corporation, agents.
543 South Spring street.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Seattle, San Francisco and Los Angeles and Norfolk, Baltimore and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company.
208 West Eighth street. Phone Main 808.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 21 days from Vancouver, Seattle, Tacoma, Portland, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
Lane Mortgage Bldg. Phone Metropolitan 6140.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma; monthly to Jacksonville, Fla.

PACIFIC MAIL STEAMSHIP CO.
Passenger Offices, 503 South Spring street.
Freight Offices, 108 West Sixth street.
SAILINGS—Passengers and Freight.
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Baltimore, Norfolk, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Los Angeles and San Francisco.
SAILINGS—Direct Freight Service.
Every 7 days. Eastward calls: San Francisco, Los Angeles, Westbound: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
[illegible] Transportation Bldg. Phone VAndike 4671
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA-PACIFIC LINE
International Mercantile Marine Company.
Freight Offices—Pacific Steamship Company, 322 Citizens National Bank.
Passenger Offices—[illegible] S. Spring st. Phone 977-[illegible]
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

TRANSMARINE LINES
(Transmarine Corporation.)
G. Tyler Smith, agent.
A. G. Bartlett Bldg. Phone Broadway 2582 [illegible]
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED AMERICAN LINES, INC.
Los Angeles Steamship Company, agents.
407 Central Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company.
Stock Exchange Building.
FREIGHT ONLY.

Leo E. Archer, now on the job as Pacific Coast manager of I. M. M. affairs, headquarters San Francisco. Mr. Archer had 26 years' service with I. M. M. Atlantic Lines. He succeeds Mr. T. H. Larke, who resigned on account of ill health.

NEW AURANIA

Cunard Line's latest addition, the Aurania, a passenger carrier of 15,000 tons, is equipped with the Sperry gyro-compass. The Aurania arrived at New York recently on her maiden voyage. She was built by Swan, Hunter & Wigham Richardson for the Cunard Line. The vessel is 538 feet long, burns either oil or coal, and is driven at 16 knots by two sets of steam turbines.

Party of Notables—Starting maiden voyage on steamer Catalina. Los Angeles Harbor. Port to starboard they are: Fred L. Baker, chairman of the board Los Angeles Shipbuilding & Drydock Corporation. Erle M. Leaf, president Los Angeles Shipbuilding & Drydock Corporation. Thomas Farley, William Wrigley's representative. J. N. Stewart, vice-president Wilmington Transportation Company. L. R. McFie, general manager of the Los Angeles Shipbuilding & Drydock yard. J. H. Patrick, president Wilmington Transportation Company. John K. Bulger, supervising inspector, First District, United States Steamboat Inspection Service.

INTERCOASTAL

SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, and New York, Philadelphia, Norfolk and Baltimore.

PORTLAND

AMERICAN-HAWAIIAN S. S. CO.
C. D. Kennedy, agent.
Railway Exchange Building.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Astoria, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Astoria, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
400 Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Providence, Philadelphia, Baltimore and Portland, Me.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
Spalding Building. Phone Broadway 4378.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 21 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.

MUNSON-McCORMICK LINE
McCormick Steamship Company.
181 Burnside street. Phone Broadway 1498.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland and Seattle; monthly to Jacksonville, Fla.

PACIFIC MAIL STEAMSHIP CO.
Norton, Lilly & Co., agents.
Yeon Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days. Eastward calls: San Francisco, Los Angeles. Westbound: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland, and Seattle.

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
1008 Spalding Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Pacific Steamship Company, freight agents.
Admiral Line Terminal.
SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.

UNITED AMERICAN LINES, INC.
Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

VANCOUVER

ARGONAUT STEAMSHIP LINE
B. W. Greer & Son, Ltd.
602 Hastings St., West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Every 30 days, Vancouver to Montreal. Through bills of lading from other Pacific Coast ports.

DOLLAR STEAMSHIP LINE
Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Vancouver, B. C., Seattle, San Francisco, Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.

ISTHMIAN STEAMSHIP LINES
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Empire Shipping Company, Ltd.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 21 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Galveston, New Orleans, and Mobile.

MUNSON-McCORMICK LINE
Kingsley Navigation Company, Ltd.
602 Pacific Building. Phone Seymour 9506.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco and North Pacific Coast ports.

PACIFIC-CARIBBEAN GULF LINE
Dingwall Cotts & Co., agents.
413 Pacific Building.
FREIGHT ONLY
SAILINGS—Monthly from North Pacific ports, San Francisco, Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports.

ORIENTAL

SAN FRANCISCO

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
Dodwell & Company, Ltd., agents.
2 Pine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street.
Phone Garfield 4300.

PASSENGERS AND FREIGHT
SAILINGSTrans-Pacific.
Fortnightly from San Francisco to Honolulu, Kobe, Shanghai, Hongkong, Manila and Singapore.

FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings between San Francisco, Seattle, Vancouver, Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles.

THE "PHANTOM" CONTEST

THE cash prize contest of the Sperry Gyroscope Company of Brooklyn, New York, which called for a title for a picture showing "Metal Mike" (gyro-pilot or automatic steering device) in control of the wheel with a phantom of the traditional quartermaster standing at the wheel, opened June 1 and closed August 31.

This contest, which was limited to seagoing personnel of the merchant service and navies of the world, and seagoing personnel temporarily on land duty, such as port captains, marine superintendents, etc. (which included the personnel of the Great Lakes), created a great deal of interest throughout the world.

Contributions were received from all over the world, and the following are the winning titles and the contestants as selected by the judges:

First prize, $100—A Fading Phantom—An Accurate Reality—Master F. B. Parsons, steamer Harry Coulby, Great Lakes Steamship Company, Cleveland, Ohio.

Second prize, $50—With Sperry Steering, He's Disappearing—Captain William R. Leith, barge C. Standard Oil Company (Indiana), Whiting, Indiana.

Third prize, $25—Real Iron Men, Have Come Again—Chief Mate Walter G. Hodgins, steamship Norfolk, Coastwise Transportation Corporation, Boston, Massachusetts.

The next five prizes, $5 each:

The Human Equation Eliminated—Everett D. Saunders, third mate, steamship Selwyn Eddy, Castner, Curran & Bullitt, Norfolk, Virginia.

Metal Mike and Vanishing Jack—Master Robert E. Hudgins, steamship Bylayl, Pocahontas Steamship Company, New York City.

Quartersmasters Present and Past—C. M. Christensen, second officer, steamship Martinique, Colombian Line, New York City.

Modern Mariner versus Ancient Mariner Gordon B. Babbitts, radio operator, Standard Oil Company of New Jersey, New York City.

Metal Supersedes Mettle—Lieutenant Kenneth L. Coontz, U. S. S. Corry, United States Navy, New York City.

The judges in this contest were T. H. Rossbottom, general manager, United States Lines, New York; J. L. Luckenbach, vice-president, Luckenbach Steamship Company, New York; and Captain A. M. Chalmers, assistant marine superintendent, Cunard Company, who acted for Captain D. S. Miller, marine superintendent of the Cunard Company, who was ill at the time.

ORIENTAL

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
Merchants Exchange Bldg. Phone Sutter 3414.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NIPPON YUSEN KAISHA

Dodwell & Company, Ltd., agents.
2 Pine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Regular service between China, Japan ports and United States Atlantic ports via Panama Canal, vessels calling at San Francisco on both outward and homeward voyages. One arrival monthly from Japan, discharging cargo at San Francisco. One to two sailings monthly homeward, occasionally loading cargo for Yokohama, Kobe and Shanghai.

OSAKA SHOSEN KAISHA

McCormick, McPherson & Lapham.
503 Market street. Phone Kearny 3632.
SAILINGS—San Francisco Service (FREIGHT ONLY).
Monthly service to and from Yokohama, Kobe, Moji, Shanghai, Hongkong and Singapore.
SAILINGS—Los Angeles Service (PASSENGERS AND FREIGHT).
A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, the Panama Canal and Los Angeles.

PACIFIC MAIL STEAMSHIP CO.

508 California street. Phone Sutter 3800.
(Operating U. S. S. B. vessels.)
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific Service.
Every 14 days from San Francisco to Honolulu, Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—Hongkong-India (Freight Only.)
Connection at Hongkong every 2 weeks for India ports.

ROOSEVELT-KOKUSAI LINE

General Steamship Corporation, agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—At frequent intervals from San Francisco and Los Angeles to Yokohama, Kobe, Shanghai, Hongkong and other Oriental ports.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels.)
112 Market street. Phone Sutter 7640.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular intervals from Los Angeles, San San Francisco, thence direct to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Dairen, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
549-51 Market street. Phone Sutter 3900.
PASSENGER AND FREIGHT
SAILINGS—Twice a month between San Francisco, Honolulu, Yokohama, Kobe, Nagasaki, Shanghai and Hongkong.
SAILINGS—Monthly to China and Japan on steamers from the West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings on round-the-world service and Oriental-New York via Panama Canal.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
222 Robert Dollar Bldg. Phone Garfield 3899.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

SEATTLE

ADMIRAL ORIENTAL LINE

L. C. Smith Building. Phone Elliott 2068.
SAILINGS—PASSENGERS AND FREIGHT.
Every 12 days between Seattle, Victoria, B. C., Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—FREIGHT ONLY.
Regular service to Vladivostok, Dairen, Tientsin, Tabu Bar, Tsingtao, Shanghai and Japan ports on either outward or homeward voyages, as freight offers justify direct call.
SAILINGS—Monthly service to Yokohama, Kobe, Shanghai, Fuochow, Amoy, Swatow, Manila, Cebu and Iloilo.

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Stuart Building. Phone Elliott 0147.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

DOLLAR STEAMSHIP LINE

Admiral Oriental Line, agents.
L. C. Smith Building. Phone Elliott 0794.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular sailings North Pacific Coast ports to Shanghai, Kobe, Hongkong and Manila, returning via Los Angeles and San Francisco.

R. T. JOHNS & COMPANY

R. T. Johns & Company, agents.
Central Building. Phone Elliott 7697.
FREIGHT ONLY.
SAILINGS—Tramp service between Seattle and Oriental ports of Yokohama, Kobe, Nagoya, Shimidzu and Moji.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
American Bank Building. Phone Elliott 1450.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco, Portland, Seattle and Puget Sound ports, thence to China and Japan.

NIPPON YUSEN KAISHA

Colman Building. Phone Elliott 3514.
PASSENGERS AND FREIGHT.
SAILINGS—Frequent intervals, calling at Victoria or Vancouver, B. C., Yokomama, Kobe, Nagasaki, Shanghai, Hongkong or other Oriental ports as inducements offer.

OSAKA SHOSEN KAISHA

W. C. Dawson & Company, agents.
Mutual Life Building. Phone Elliott 0842.
PASSENGERS AND FREIGHT.
SAILINGS—Regular fortnightly service to Yokohama, Kobe, Moji, Dairen, Shanghai, Manila and Hongkong.

SUZUKI & COMPANY

Colman Building. Phone Main 7830.
FREIGHT ONLY.
SAILINGS—Irregular service between Seattle and Japanese ports.

THORNDYKE SHIPPING CO.

L. C. Smith Building. Phone Main 3168.
FREIGHT ONLY.
SAILINGS—Regular service between Puget Sound, Grays Harbor, Vancouver and Yokohama, Kobe, Osaka and Nagoya

WALKER-ROSS, INC.

L. C. Smith Building. Phone Elliott 1074.
FREIGHT ONLY.
SAILINGS—Regular service between Seattle and Yokohama, Kobe, Osaka and Nagoya

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
Central Building.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Seattle to Yokohama, Kobe, Osaka and Nagoya.

LOS ANGELES

CANADIAN GOVERNMENT MERCHANT MARINE

Dodwell & Company, Ltd., agents.
412 Union Oil Bldg. Phone Broadway 7900 and Vandike 4044.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China, ports, returning via Los Angeles and San Francisco.

DOLLAR STEAMSHIP LINE

312 Mortgage Guarantee Bldg. Phone 874 891
PASSENGERS AND FREIGHT
SAILINGS—Fortnightly from Los Angeles to San Francisco, Honolulu, Kobe, Shanghai, Hongkong, Manila and Singapore.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings between Los Angeles, San Francisco, Seattle, Vancouver, Yokohama, Kobe, Shanghai, Hongkong, and Manila

OSAKA SHOSEN KAISHA

McCormick, McPherson & Latham, agents.
Transportation Bldg. Phone Vandike 6171.
PASSENGERS AND FREIGHT.
SAILINGS—A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong.

ROSE CITY

Charles L. Wheeler, vice-president and general manager of the McCormick Line, announces that the passenger steamer Rose City, recently purchased from the San Francisco & Portland Steamship Company, will be operated between Portland and Los Angeles via San Francisco. F. W. Brose, passenger agent of the McCormick Line at San Francisco, has been promoted to general passenger agent.

U. A. L. AGENTS

The United American Lines advise that, effective November 1, their organization in Baltimore will be taken over by Dichmann, Wright & Pugh, Inc., who will represent their joint service with the Hamburg-American Line in the Hamburg trade, and Houlder Weir & Boyd in the intercoastal trade. This is an extension of the arrangement by which Dichmann, Wright & Pugh, Inc., were recently appointed agents of the United American Lines at Norfolk and Philadelphia.

ITALIAN LINE

The Navigazione Liberia Triestira, a new Italian steamship company, is reported to have decided upon a regular service between Italian ports and San Francisco via San Pedro, carrying freight only for the present. Two steamers of this company have already called at San Francisco—the Brenta and Carnia—and the experiment is declared to have proven so satisfactory that a regular service is now decided upon. The third vessel to call is the Piave, en route to Pacific Coast from Shields, England. A regular schedule will soon be announced.

LONG BEACH

Major R. G. McGlone, U. S. A., retired, has been appointed harbor engineer at Long Beach Harbor by the city council. Appointment was made upon recommendation of Col. Edward N. Johnson, the city's consulting engineer in harbor work, and City Manager Windham. The first task to be started in the Long Beach Harbor improvement program, now that dredging is well under way, will be the construction of the west jetty at the harbor entrance. The jetty will keep the harbor entrance free from silt after dredging operations are completed and will permit the reclamation of several hundred acres of outer harbor frontage.

ORIENTAL

Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, Panama Canal and Los Angeles.

ROOSEVELT-KOKUSAI LINE

General Steamship Corporation, agents.
541 So. Spring street.
FREIGHT ONLY.
SAILINGS—At frequent intervals from San Francisco and Los Angeles to Yokohama, Kobe, Shanghai, Hongkong and other Oriental ports.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels.)
701-02 Transportation Bldg. Phone Tucker 5969.
FREIGHT ONLY.
SAILINGS—At intervals from Los Angeles and San Francisco, thence to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Dairen, Taku Bar and Saigon if inducements offer.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
S. L. Kreider, agent.
375 Pacific Electric Bldg. Phone TRinity 6556.
PASSENGERS AND FREIGHT.
SAILINGS—Regular to China and Japan via San Francisco on steamers of Japan, Hongkong, San Francisco line.
SAILINGS—Monthly to Oriental ports via San Francisco on steamers from West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

PORTLAND

AMERICAN ORIENTAL SERVICE

A. M. Gillespie, Inc., agent.
Board of Trade Bldg. Phone Broadway 4348.
SAILINGS—Monthly to ports of Japan and China as inducements offer.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
702 Wilcox Building. Phone Main 4113.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.

NORTH CHINA LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient, calling at Yokohama, Kobe, Shanghai, Taku Bar and Dairen.

PORTLAND-ORIENT LINE

Wallem & Company, agents.
Porter Building. Phone Broadway 1444
SAILINGS—From Portland to Yokohama, Kobe, Shanghai, Tsingtao, Taku Bar, Dairen, Vladivostok.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
Oregon Pacific Company, agents.
203-4 Wilcox Building. Phone Bdwy. 4529.
FREIGHT ONLY.
SAILINGS—Monthly from Portland to Oriental ports.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

SOUTH CHINA LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company.
Porter Building. Phone Broadway 5360.
FREIGHT ONLY.
SAILINGS Every 2 weeks from Portland to Yokohama, Kobe, Hongkong and Manila.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company.
1109 Porter Building.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Yorkshire Building. Phone Seymour 9576.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong and Manila.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco

CANADIAN PACIFIC STEAMSHIPS, LTD.

Canadian Pacific Railway Station. Phone Seymour 2630.
PASSENGERS AND FREIGHT.
SAILINGS—Every 14 days from Vancouver to Japanese ports, Shanghai, Hongkong, and Manila.

DOLLAR STEAMSHIP LINE

Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings from North Pacific ports to Yokohama, Kobe, Shanghai, Hongkong, Manila, returning via Los Angeles and San Francisco

NIPPON YUSEN KAISHA

B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Vancouver and ports in Japan, China and Philippines.

OSAKA SHOSEN KAISHA

Empire Shipping Company, Ltd.
815 Hastings St., W. Phone Seymour 8014
8014
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks to all ports in Japan and China, also Vladivostok, Singapore, Bombay, etc.

SUZUKI & COMPANY

B. L. Johnson Walton & Company.
837 Hastings street, W. Phone Seymour 7747
FREIGHT ONLY.
SAILINGS—Irregular service between Pacific Coast ports and Japan ports.

WALKER-ROSS, INC.

Canadian American Shipping Company, Ltd
Phone Seymour 2198.
FREIGHT ONLY.
SAILINGS—Regular service to Yokohama Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Co., Ltd.
Merchants Exchange Building
FREIGHT ONLY.
SAILINGS Every 2 weeks to Yokohama Kobe, Osaka and Nagoya

UNITED KINGDOM---CONTINENTAL EUROPE

SAN FRANCISCO

BLUE FUNNEL LINE

Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.
2 Pine street. Phone Sutter 4201.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow

BLUE STAR LINE

[illegible]
REFRIGERATOR AND GENERAL CARGO
SAILINGS—[illegible]

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company [illegible]
PASSENGERS AND FREIGHT.
SAILINGS—[illegible]

AN OLD SEA CHEST

THE real deep sea sailor of two generations back usually took great pride in his sea chest, and many were the hours spent in loving labor with crude tools, decorating cover and sides. Some of these boxes display wonderful taste in design and skill in execution, and fortunate indeed is the collector of furnishings who, having the proper setting, can add to his treasures one of these romance-filled boxes.

Unique among such chests is one now being shown and offered for sale in San Francisco. This chest was designed by Captain Edgar Wakeman, well known in the early history of San Francisco, and fashioned for him by a master workman, an old Norwegian ship's carpenter, who spent many months in the elaborate hand carving and the skillful inlaying with silver, ivory and mother-of-pearl. The chest is mahogany, large in size, the cover having been made from a mahogany plank some five feet long, and the elaborate carving and inlay include an encircling silver cable, a silver anchor at each corner, the leaves of the laurel, stars, an American eagle and a flag.

For many years the personality of Captain Wakeman was closely associated with all that was romantic and adventurous in the young and growing community of San Francisco. His coming was through his "running away with a steamboat," for its owner, of course, the property having been seized by the sheriff. But the discharge of the debt, with the future fortunes of the owner, turned upon getting the New World promptly into California waters. Captain Ed Wakeman was adjudged the one man in New York fitted for so delicate and daring an enterprise.

Arriving here, after having brought so small a craft around the Horn, Captain Wakeman took a prominent part in the actions of the first Vigilance Committee. He was soon indicted as "the leading Vigilante," only half a dozen other names being known. But when these few names, led by that of Captain Wakeman, were published in the morning newspaper, the whole personnel of that famous tribunal hastened to make itself known, to prove that it was indeed the responsible citizenship of the community which had undertaken to change the whole political atmosphere.

Captain Wakeman thereafter figured as the "Commodore of San Francisco Bay," with a flotilla of boats under his command, and promptly and decisively exiled or

UNITED KINGDOM---CONTINENTAL EUROPE

ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Service between Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports, via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation, sub-agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
710 Balfour Building. Phone Sutter 6478-6479.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports when inducements offer.

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
351 California street. Phone Sutter 6427.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES

E. C. Evans & Sons, agents.
260 California street. Phone Douglas 8040-1-2.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Co., general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint service of the Royal Mail Steam Packet Company and Holland-America Line.)
401 Market street. Phone Douglas 7510.
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

NORWAY PACIFIC LINE

485 California street. Phone Sutter 5099.
FREIGHT ONLY.
SAILINGS—From San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia. Sailings every 30 days.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.

Sudden & Christenson, Pacific Coast Agents.
230 California street. Phone Garfield 2846.
For passengers. Phone Sutter 4r.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SEATTLE

BLUE FUNNEL LINE

Dodwell & Company, Ltd., agents.
Stuart Building. Phone Elliott 0147.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

BLUE STAR LINE

Admiral Oriental Line, agents.
L. C. Smith Bldg. Phone Elliott 0974.
REFRIGERATOR AND GENERAL CARGO.
SAILINGS—Every 21 days from Vancouver, Seattle, Portland, San Francisco to Glasgow, Liverpool, Southampton and London.

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.
823 Alaska Building. Phone Elliott 9104.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service. Pacific Coast ports direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Service between Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation
Colman Building. Phone Elliott 5706.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

(Furness, Withy & Company Ltd.)
Furness (Pacific), Ltd.
Burchard & Pilkey, agents, 705 Arctic Bldg.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 5706.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
Stuart Building. Phone Elliott 1464.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings every 2 weeks.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

W. R. Grace & Company.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint Service of the Royal Mail Steam Packet Company and Holland-America Line.)
204-206 Rainier Building. Phone Elliott 4944
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2453.
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.

Sudden & Christenson, agents.
Arctic Building.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

returned to their native countries a great number of lawless characters who had come here, not to seek gold in the mountains, but to prey upon their fellow men.

A remarkable public dinner was tendered Captain Wakeman when, immediately following his Vigilante experiences, he sailed away from the port. During this dinner he was presented, as a mark of public gratitude, with a large silk flag, a big silver speaking trumpet, a gold watch on a long chain, and a cluster diamond pin. Some years afterward Frank Pixley in his "Argonaut" commented on this dinner, with its gifts and its gathering of enthusiastic early San Franciscans, as something belonging peculiarly to California when it was young—something which could never be exactly duplicated.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

Of Pacific Marine Review, published monthly at San Francisco, Cal., for October 1, 1924.
State of California,
County of San Francisco, ss.

Before me, a notary public in and for the State and county aforesaid, personally appeared E. N. De Roche, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the Pacific Marine Review, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher, J. S. Hines, care Claremont Country Club, Oakland, Cal.
Editor, A. J. Dickie, 1.36 Mariposa avenue, Berkeley, Cal.
Business Manager, E. N. De Roche, 943 Fresno avenue, Berkeley, Cal.

2. That the owner is: If the publication is owned by an individual his name and address, or if owned by more than one individual the name and address of each, should be given below; if the publication is owned by a corporation the name of the corporation and the names and addresses of the stockholders owning or holding one per cent or more of the total amount of stock should be given. J. S. Hines, care Claremont Country Club, Oakland, Cal.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

E. N. De Roche

Sworn to and subscribed before me this 1st day of October, 1924.

M. CLARK
Notary Public.

(My commission expires March 4, 1928.)

UNITED KINGDOM---CONTINENTAL EUROPE

LOS ANGELES

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company.)
Dodwell & Company, Ltd.
412 Union Oil Building. Phone Broadway 7900 and Vandike 4944.
FREIGHT ONLY.
SAILINGS—Every 6 weeks from North Pacific Coast ports, including San Francisco and Los Angeles to London, Liverpool and Glasgow, via Panama Canal.

EAST ASIATIC COMPANY, LTD.
Balfour, Guthrie & Company, agents.
315 Union Oil Bldg. Phone 822-134.
PASSENGERS AND FREIGHT.
SAILINGS—Regular services, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles, San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation, agents.
541 South Spring street.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
(Furness Withy & Company, Ltd.)
Swayne & Hoyt, Inc., agent.
488 Pacific Electric Building.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco, Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.

GENERAL STEAMSHIP CORP.
541 South Spring street.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
315 Union Oil Building. Phone 7865
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every week from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
M. F. & H. R. McLaurin, Inc.
406 South Main street. Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE
(Joint service of the Hamburg-America Line and Royal Mail Steam Packet Co.)
C. J. Lehman, agent.
123 E. Sixth street. Phone Trinity 3171.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from Vancouver, Seattle, Portland, Astoria, San Francisco and Los Angeles to Liverpool, London, Bristol and Glasgow, Hamburg.

NORWAY PACIFIC LINE
703 Palos Verdes street, San Pedro.
FREIGHT ONLY.
SAILINGS—Four motorships operating from San Francisco and Los Angeles to United Kingdom Continental ports and Scandinavia. Sailings every 30 days.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR
Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044

FREIGHT ONLY.
SAILINGS—Service from Vancouver, Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa at government offer.

UNITED AMERICAN LINES, INC.
Los Angeles S.S. Company, agents.
407 Central Building.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

PORTLAND

BLUE FUNNEL LINE
(Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.)
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London and Glasgow.

BLUE STAR LINE
Pacific Steamship Company.
[illegible] Building. Phone Main 4262.
REFRIGERATOR AND GENERAL CARGO.
SAILINGS—Every 21 days from Vancouver, Seattle, Portland, San Francisco to Glasgow, Liverpool, Southampton and Antwerp.

EAST ASIATIC COMPANY, LTD.
Chalmers & Cartwright, Inc., agents.
Porter Building. Phone Broadway 4152.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2691.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports with transshipment at Hull.

FRENCH LINE
(Compagnie Generale Transatlantique.)
General Steamship Corporation, agents.
Irwin Building. Phone Broadway 7724.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE
Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
Barrett & Hilbert, agents for Sailing Bldg.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Portland, San Francisco and Los Angeles to [illegible] Glasgow, Liverpool, London, Havre, Hull and other ports.

GENERAL STEAMSHIP CORP.
[illegible] Building. Phone Broadway 7724.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE
Balfour, Guthrie & Company.
[illegible] Street. Phone Broadway 7724.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, Portland, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2691.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every week from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE
[illegible]
[illegible]
PASSENGERS AND FREIGHT.
SAILINGS—[illegible]

NORTH PACIFIC COAST LINE
[illegible]
[illegible]

DE LAVAL

The William Constable Company, Providence building, Duluth, Minnesota, now represent the De Laval Steam Turbine Company of Trenton, New Jersey, having purchased the H. J. Rich Company, the former representative. President Constable was chief mechanical and electrical engineer for the Republic Iron & Steel Company of Duluth for the past five years, and previously was connected with the General Electric Company in the mining, locomotive and steam turbine department. His wide experience assures valuable engineering and sales service to users of De Laval products. G. C. Kahl, 404 Dwight building, Kansas City, Missouri, has been appointed sales representative of the De Laval Steam Turbine Company in Arkansas, Nebraska, Kansas and Oklahoma and parts of Iowa and Missouri. Kahl was formerly with the Thermal Efficiency Company. De Laval representatives in Kansas City, and prior to that time was sales engineer for the General Electric Company in Kansas City. Mr. Kahl has had wide experience in the lines manufactured by the De Laval Steam Turbine Company, including steam turbines, centrifugal pumps and blowers, speed reducing gears, flexible couplings, small water turbines, and other equipment.

PASSENGERS AND FREIGHT.
SAILINGS—[illegible] ver, Seattle, Portland, Astoria, San Francisco, Los Angeles to Liverpool, London, Bristol and Glasgow, Hamburg.

ROUND-THE-WORLD

SAN FRANCISCO

DOLLAR STEAMSHIP LINE
The Robert Dollar Co., [illegible] California street.
PASSENGERS AND FREIGHT.
SAILINGS—[illegible] San Francisco, Honolulu, Kobe, Shanghai, Hongkong, Manila, Singapore, Colombo, Port Said, Naples, Genoa, Marseilles, Gibraltar, New York, Havana.

FREIGHT ONLY.
REGULAR SAILINGS. Between San Francisco, Honolulu, Kobe, Shanghai, Hongkong, Manila, Singapore, Colombo, Port Said, Suez.

LOS ANGELES

DOLLAR STEAMSHIP LINE
[illegible] Angeles Street. Phone 874-161.
PASSENGERS AND FREIGHT.
SAILINGS—[illegible] San Francisco, Honolulu, Kobe, Shanghai, Hongkong, Manila, Singapore, Colombo, Port Said, Naples, Genoa, Marseilles, Gibraltar, New York, Havana.

FREIGHT ONLY.
REGULAR SAILINGS. Between Los Angeles, San Francisco, Honolulu, Kobe, Shanghai, Hongkong, Manila, Samarang, Singapore, Colombo, Port Said, Suez, Boston, New York.

UNITED KINGDOM---CONTINENTAL EUROPE

cisco and Los Angeles and Liverpool, London, Bristol, Swansea, Hamburg.

SOCIETE GENERALE de TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—From Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.

UNITED AMERICAN LINES, INC.

Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Broadway 3701.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Yorkshire Building. Seymour 6576.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

BLUE STAR LINE

Canadian Pacific Ry. Co., Seattle.
405 Lowman & Hanford Building. Phone Elliott 4200.
REFRIGERATOR AND GENERAL CARGO.
SAILINGS—From Vancouver, Victoria, Seattle, Portland, San Francisco, Los Angeles, Glasgow, Liverpool and London.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 8364.
FREIGHT ONLY.
SAILINGS—Monthly to Avonmouth via Panama.

EAST ASIATIC COMPANY, LTD.

R. P. Johnson, Walter A. Foss, agents.
837 Hastings st. W. Phone Seymour 2747.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast to Copenhagen direct or via Hamburg, Hull, Gothenburg, Colombo, with transshipment to all Scandinavian and Baltic ports.

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

B. W. Greer & Son, Ltd.
602 Hastings street West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Service from Puget Sound, Portland, San Francisco, Los Angeles and San Diego to Hamburg, Hull, Rotterdam and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via transshipment at Hull.

FRENCH LINE

Compagnie Generale Transatlantique.)
Empire Shipping Co., Ltd. Phone Seymour 8014
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver to Bordeaux, Havre, Antwerp and Hamburg.

FURNESS LINE

Furness Withy & Company, Ltd.
Furness (Pacific), Ltd.
1232 Standard Bank Building.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly from Vancouver and other Pacific Coast ports to United Kingdom.

GENERAL STEAMSHIP CORP.

Empire Shipping Co., Ltd., 818 Hastings St.W.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—From Pacific Coast ports to United Kingdom and Scandinavia, as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company, Ltd.
Phone Seymour 6961.
FREIGHT ONLY.
SAILINGS—From Vancouver, Victoria, Seattle, Portland, San Francisco, Los Angeles and San Diego to Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer. From August to December, fortnightly.

ISTHMIAN STEAMSHIP LINES

B. W. Greer & Son, Ltd.
602 Hastings street West. Phone Seymour 2377.
SAILINGS—Intercoastal Service.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.

JOHNSON LINE

C. Gardner Johnson & Company, Ltd.
Metropolitan Building. Phone Seymour 357.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Aarhuslerg, Malmo, Copenhagen, Stockholm, and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint service of The Royal Mail Steam Packet Company and The Pacific Steam Navigation Company.)
R. P. Rithet & Co., Ltd., general agents.
Pacific Building. Phone Seymour 7108.
PASSENGERS AND FREIGHT.
SAILINGS—From Seattle, Victoria, San Francisco, Los Angeles and Ensenada, London, Rotterdam, Antwerp, Hamburg.

PACIFIC MAIL STEAMSHIP CO.

508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight. Twice a month between San Francisco, Los Angeles, calling at ports on West Coast of Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, and Taltal. (Other ports as inducements offer.)

TOYO KISEN KAISHA

(Oriental Steamship Company.)
549 31 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via Honolulu.

Mexico---Central America--Canal Zone---South America

SAN FRANCISCO

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

W. R. Grace & Company, general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports in Peru and Chile as inducements offer.

LATIN-AMERICA LINE

R. S. Silva & Company, general agents.
140 Clay street. Phone Sutter 2452.
SAILINGS—Pacific Coast - Mexico - Central America.
Monthly from Portland, Seattle and San Francisco to all ports on West Coast of Mexico and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Portland, Seattle and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

McCORMICK STEAMSHIP CO.

215 Market street.
PASSENGERS AND FREIGHT.
SAILINGS—Every three weeks from San Francisco to San Jose del Cabo, La Paz, Guaymas, Mazatlan, Salina Cruz, Acapulco, Manzanillo, San Blas and Manzanillo.

MEXICAN FREE PORTS S. S. LINE

Direct Connections
[illegible] Seymour 7400
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to the West Coast of Mexico.

MEXICAN STATES LINE

[illegible] Phone Sutter 7400.
311 Sansome st. Phone Sutter 7400.
PASSENGERS AND FREIGHT.
SAILINGS—Every 8 days from San Francisco and Los Angeles to West Coast of Mexico and Central America.

PACIFIC LINE

The Pacific Steam Navigation Company.
550 Market street. Phone Sutter 4422.
PASSENGERS AND FREIGHT.
SAILINGS—Regular s.s.s Panama Canal, Guayaquil, Callao, Mollendo, Arica, Iquique, Antofagasta, Valparaiso, Talcahuano, Coronel, also to Havana and New York; also via Cristobal to Havana to Spain, France and England. Steamers connect at Panama for Nassau and Los Angeles ports.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels)
Sawyer & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Pisco and San Juan, Curacao, Montevideo, Buenos Aires and Santos; also as inducements offer, Para, Pernambuco, Bahia, Rio de Janeiro and Bahia Blanca.

PACIFIC MAIL STEAMSHIP CO.

508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight. Twice a month between San Francisco, Los Angeles, calling at ports on West Coast of Mexico, Central America and Canal Zone.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta and Taltal. (Other ports as inducements offer.)

TOYO KISEN KAISHA

(Oriental Steamship Company.)
549 31 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly on steamers from Oriental ports via Honolulu.

SEATTLE

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 5706.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

W. R. Grace & Company, agents.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports of Peru and Chile as inducements offer.

LATIN AMERICA LINE

Lea Mathews Shipping Corporation.
Alaska Building. Phone Elliott 4567.
FREIGHT ONLY.
SAILINGS—Pacific Coast-Mexico-Central America.
Monthly from Seattle, Portland and San Francisco to all ports on West Coast of Mexico and Central American ports as far south as Balboa.
SAILINGS—Pacific Coast-South America.
Monthly from Seattle, Portland and San Francisco to principal West Coast ports of South America as far south as Valparaiso.

PAC.-ARGENTINE-BRAZIL LINE

(Operating U. S. S. B. vessels.)
Sawyer & Hoyt, Inc., managers.
Lehigh Nos. 4 Central Bldg. Phone Elliott 6383
SAILINGS—FREIGHT ONLY.
Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles via Panama Canal to Pisco and San Juan, Curacao, Montevideo, Buenos Aires and Santos; also as inducements offer, Para, Pernambuco, Bahia, Rio de Janeiro and Bahia Blanca.

PAN-PACIFIC LINE

Norton, Lilly & Company, general agents.
Yeon Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Regular fast freight service between Pacific Coast ports and West Coast of South America, calling at Paita, Pimentel, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta and Taltal. (Other ports as inducements offer.)

LOS ANGELES

GENERAL STEAMSHIP CORP.

241 South Spring street.
PASSENGERS AND FREIGHT.
SAILINGS—West Coast of South America Service.
Monthly from Seattle, Portland, San Francisco and Los Angeles to Central America and South America.

GRACE LINE

M. F. & H. R. McLaurin, Inc.
406 South Main street. Phone Main 4800.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly service from Pacific Coast ports to Talara, Paita, Salaverry, Callao, Pisco, Mollendo, Arica, Iquique, Antofagasta, Coquimbo, Valparaiso and other ports in Peru and Chile as inducements offer.

MEXICAN FREE PORTS S.S. LINE

Wagner & Kruger, Sole Transportation Bldg.
PASSENGERS AND FREIGHT.
SAILINGS—Every 30 days from San Francisco and Los Angeles to West Coast of Mexico.

MEXICAN STATES LINE

McCormick, McPherson & Lapham, agents.
Transportation Bldg.
PASSENGERS AND FREIGHT.

NEW TYPE AUTOMOBILE FERRY

AN unusual type of oceangoing automobile ferry is the steamer Olympic, which has recently been delivered by the Seattle plant of the Todd Shipyards Corporation for operation in the Straits of Juan de Fuca, between Port Angeles, Washington, and Victoria, British Columbia. The water on this run at times is very rough and for this reason both ends of the automobile deck are closed with steel doors. The Olympic maintains a running schedule of 16 knots.

This vessel was formerly the steamer Sioux, built in 1910, her dimensions being 148 feet 3 inches in length, 24 feet 2 inches beam, 14 feet 8 inches depth, gross tonnage 461 and net tonnage 266; motive power consisted of two Seabury boilers equipped for the burning of fuel oil and one 4-cylinder triple-expansion reciprocating engine developing 1400 horsepower at 283 revolutions a minute.

In making the alterations the vessel's superstructure was completely dismantled to the main deck, the hull cut between the engine and boilers, leaving engine and boilers in original position, the two portions drawn apart a distance of 24 feet 6 inches and a new steel section built in the space thus provided, increasing the over-all length to 182 feet, the gross tonnage to 1310 and net tonnage to 866. Four additional water tanks were installed in this new section.

The main deck plating was removed and the main deck line raised approximately 5 feet. The hull plating down to the turn of the bilge was removed and the main deck line raised, leaving the original framing; new deck beams and a new framing were fitted, increasing the beam of the vessel to 36 feet 6 inches. The framing is in the form of a truss, bracketed to the old frame at the bottom and to the new deck beams at both ends at the top, new shell plating being fitted from the turn of the bilge to the main deck, and new steel main and passenger decks installed. The vessel's hull is completely divided into seven watertight compartments by the construction of six steel watertight bulkheads.

The new passenger deck is covered with Raecolith composition and is completely enclosed, with the exception of the deck forward. Sides and end are fitted with windows for the full length. The after end of this deck is given up to a galley, lunch counter, and a cigar and refreshment booth. The remainder of the passenger deck provides for a purser's office, men's and women's lavatories and rest rooms, and seats to accommodate 550 passengers. These seats are constructed of Philippine mahogany with varnish finish and are fitted with leather upholstered cushions.

The entire main deck is covered with a 2-inch coating of Watsonite composition deck covering and, with the exception of the engine and boiler casings and stairways, is given up to accommodation of automobiles, of which sixty may be carried. The method of handling automobiles is by the installation of two sliding watertight doors at the bow, one hinged watertight door, port and starboard, approximately 20 feet aft of the bow, and double sliding watertight doors at the stern. Wells are provided at the forward and after ends of the main deck, in which are built turntables for turning automobiles in order that same may be unloaded at either the forward or after end of the boat.

Pacific Marine Review

The National Magazine of Shipping

DECEMBER, 1924

Official Organ
PACIFIC AMERICAN STEAMSHIP ASSOCIATION

Official Organ
SHIPOWNERS' ASSOCIATION OF THE PACIFIC COAST

Pacific Marine Review, Vol. 21, No. 12, Published Monthly at San Francisco. Entered as second class matter at the post office at San Francisco under the Act of March 3 1879 $2.00 a year.

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DECEMBER, 1924

READ
What L. S. Pourtless has to say about

NACO
ANCHOR CHAIN

Mr. Pourtless is not a salesman—but a practical Marine man. What he has to say is free from speculation or sales incentive. He knows Ships and Marine Equipment and his letter is an unbiased statement of facts.

LYKES BROS. STEAMSHIP CO., INC.
Lykes Line
GALVESTON
TEXAS

April 10th, 1924

National Malleable & Steel Castings Co.,
Cleveland, Ohio.

Dear Sirs:-

We have received your letter of April 3rd regarding your Naco anchor chain which has been supplied to a number of vessels operated by this firm, and wish to advise that we have found it to be highly satisfactory in every way - it being, in our opinion, far superior to the old stud link chain, on which we have had a great many instances, to spend quite a sum for repairs replacing lost studs in links.

We have never had a case where Naco chain has parted under any strain put upon it, and we have had some very severe tests. We, therefore, feel that we cannot praise Naco too highly, as it seems to be the finest product of this nature on the market.

Yours very truly,

LYKES BROS. S.S. Co., Inc.

By [signature] Marine Superintendent

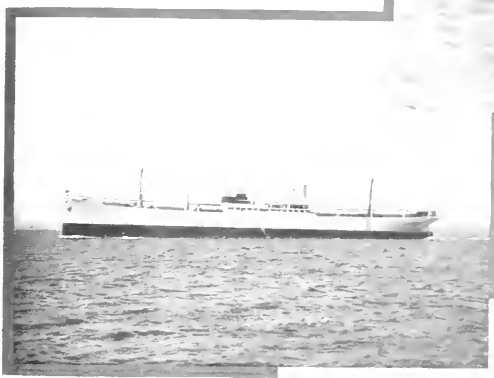
LSP:J
cc-New Orleans

Write for the Naco Booklet telling why Naco Chain is
GREATEST IN STRENGTH
MOST UNIFORM IN SIZE
and
LOWEST IN COST OF OPERATION

NATIONAL MALLEABLE AND STEEL CASTINGS CO.
Successor To
THE NATIONAL MALLEABLE CASTINGS COMPANY
General Office — Cleveland, O.

Upper right shows the Motorship Kronprins Gustaf Adolf at the W. R. Grace & Company pier, San Francisco.

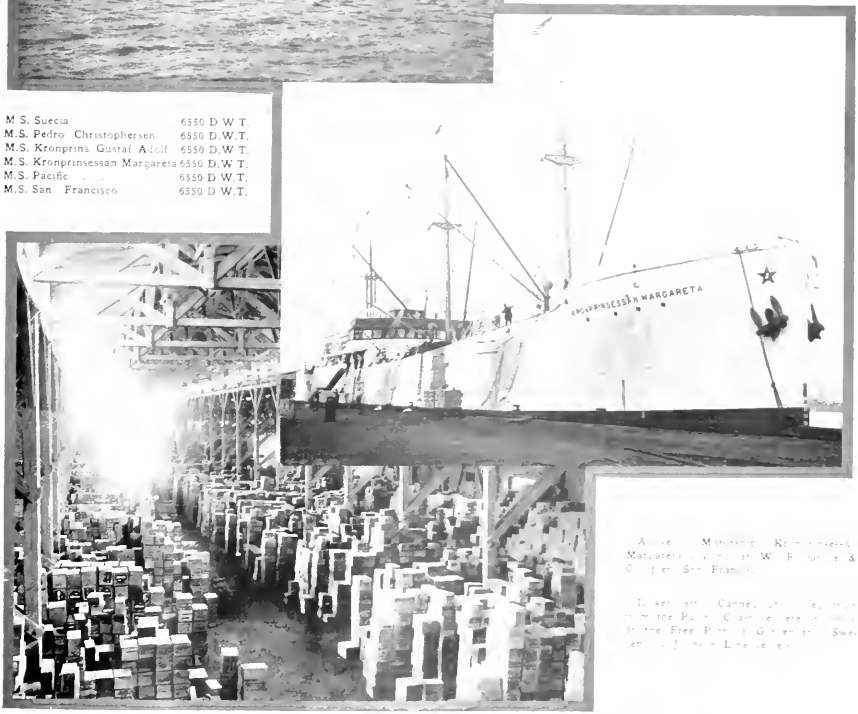
Below: Johnson Line Motorship Balboa, bound for Port Costa in San Francisco Harbor to load California barley for European markets.



Comprising the JOHNSON LINE European Fleet are the Famous Motorships

M.S. Balboa	9200 D. W. T.
M.S. Canada	9200 D. W. T.
M.S. Buenos Aires	9200 D. W. T.
M.S. Valparaiso	6550 D. W. T.
M.S. Lima	6550 D. W. T.

M.S. Suecia	6550 D.W.T.
M.S. Pedro Christophersen	6550 D.W.T.
M.S. Kronprins Gustaf Adolf	6550 D.W.T.
M.S. Kronprinsessan Margareta	6550 D.W.T.
M.S. Pacific	6550 D.W.T.
M.S. San Francisco	6550 D.W.T.



Above: Motorship Kronprinsessan Margareta loading at W. R. Grace & Co. pier San Francisco.

Below: Suecia, Canada, Pedro Christophersen and Pacific at the Port Costa grain docks in the Free Port of Copenhagen. Swedish-American Line pier.

The Johnson Line for which W. R. Grace & Co. [illegible] ports through the Panama Canal to Antwerp

DECEMBER, 1924 Vol. XX. No 12

Pacific Marine Review

The National Magazine of Shipping

576 Sacramento Street, San Francisco

339 AT 30 CHURCH STREET NEW YORK

James S. Hines, President and Publisher.

Bernard N. De Rochie, Vice-Pres. and Manager.

Entered as second class mail matter June 20, 1913, at the postoffice, San Francisco, under the Act of March 3, 1879. Entire contents copyright, 1924, by J. S. Hines.
Published on the 25th of each month preceding the publication date.
Advertising and editorial forms close on the 20th.
Subscription price, a year: domestic, $2; foreign, $3; single copies, 25c.

Alexander J. Dickie Editor.

Paul Faulkner, Advertising Manager.

Fair Play

THE intercoastal freight business through the Panama Canal has shown a very healthy growth during the past few years. Excluding the carrying of petroleum in bulk, the general freight business, intercoastal, has grown at a rate slightly under the rate of growth of the population of the Pacific Coast.

This business is dependent for its existence almost entirely on the development of the Pacific Coast. Pacific Coast products form practically the entire eastbound shipments and Pacific Coast needs make up practically the entire volume of traffic westbound. This being so, it should be obvious to all steamship companies engaged in intercoastal business that it is good for their business to patronize, so far as possible, Pacific Coast industrial, manufacturing, and distributing plants in the purchase of their voyage supplies and equipment and in the making of voyage repairs to their vessels.

Practically everything that is used in a modern steamship can be supplied as economically from Pacific Coast firms as it can be anywhere in the world; and practically everything that is so supplied, or a large proportion of the raw materials that go into the finished product, is brought by water to the Pacific Coast. So that a steamship company which buys on the Pacific Coast is in reality making business for itself with every completed purchase, and is at the same time helping to build up the industrial fabric of Pacific Coast centers into permanently established and growing sources of future business for cargo vessels.

Many of the intercoastal companies have consistently and wisely favored the Pacific Coast, but some companies are still "penny wise and pound foolish in this matter."

Let us have a little more fair play from all operators of intercoastal steamship companies and we will see much healthier growth in the future for intercoastal business by water.

The Matson Liner

THE liner to be built for the American-Hawaiian Steamship Company, for subsequent sale to and operation by the Matson Navigation Company, is at present focusing the attention of American shipbuilders.

If our information is correct, this vessel is to be rather different in appearance and in appointment from the ordinary first-class passenger liner. Her accommodations for passengers are to be equal to the highest standard afloat and her turbo-electric machinery the largest and finest commercial example of that type of propelling plant.

The specifications for the new design, as prepared by Gibbs Brothers, Inc., of New York, and said to be the most complete ever issued for a commercial vessel. In fact, "the construction, outfit, and furnishings are specified in such detail that shipbuilders in competing would be enabled to figure on a basis that would preclude the question of extras arising after the work had been undertaken."

There are 540 printed pages in the book of specifications and these are divided into sixteen separate titles and an extensive index. Title I, under the caption "General Conditions and Requirements," puts the bidder upon notice that he is bidding on a complete, thoroughly workable ship and that his bid must be so prepared that "no extra" can subsequently arise.

Under the remaining fifteen titles every item of construction, outfit, and furnishing is completely specified and described. However, there is no need to follow further than the first title. If Title I holds good to delivery of vessel, Gibbs Brothers of New York will have raised ship specifications to a plane never before reached by specification writers and will have earned the admiration and the patronage of the shipowners of America.

No Exceptions to Climate

OUR article, "The Responsibility of Pacific Coast Yards," in the November issue of Pacific Marine Review, called attention to the climatic advantages enjoyed by Pacific Coast drydocks in comparison with the docks on the Atlantic Coast. In our effort to be conservative we fell short of stating the whole truth and unintentionally made a false statement, as follows:

"The Prince Rupert yard is, on the Pacific Coast, the only one affected by freezing conditions during the winter season."

A letter received from Prince Rupert in reference to this statement says:

"Nothing could be further from the actual truth than the above statement. Ice is unknown in Prince Rupert harbor, and the temperatures in the winter are very close to Vancouver temperatures. We are not in the slightest affected by freezing conditions; in fact, since 1916, when the Prince Rupert yard began operations, by far the greatest amount of work, particularly on larger vessels, has been carried out during the winter months."

We are glad to take this first opportunity to make apology and correction. We have verified the state-

ment from Prince Rupert as correct in every particular, and are all the more proud of this Wonderland of the Pacific Slope, a pride which will be appreciated by Atlantic coastwise navigators when we tell them that Prince Rupert is a little higher north latitude than is Esquimo Bay on the Labrador Coast.

So we now state that there is no exception. Pacific Coast docks, from Panama to Alaska, enjoy ideal working conditions so far as climate is concerned.

American Trade

By E. T. CHAMBERLAIN

Transportation Division, Department of Commerce

THE story of the gradual and equable adjustment of the foreign trade of the United States during 1923 and the approach to pre-war conditions which that year marked is told more directly and simply in the returns of ships with cargo entered and cleared at ports of the United States than in any other manner.

The Ship's Net Ton

While the money value of foreign trade is important in the consideration of international balances and of finance, it gives inadequate and often wrong impressions of the actual volume of commodities exchanged and of the amount of effort involved in their production and transportation. The ship's net ton of 100 cubic feet is a fixed space capable of carrying fixed quantities of the multitude of things which comprise the world's exchanges. It is also a measure of accommodation for passengers, whose transportation, of course, is a considerable factor in the foreign trade of the United States, which in the past ten years has developed an increasing public traveling by sea for profit, instruction, or pleasure.

Ship's Average Loading Probably Less than 1914

The voyage of a ship in ballast is a tax on commerce, for its cost must be met by freight charges on the voyage with cargo. Entries and clearances of ships in ballast may properly be excluded in examining the changes in oversea trade. Ships, of course, may be wholly or partly laden, so a variable factor is thus introduced in any consideration of the amount of ships' net tonnage entered or cleared with cargo as an index of trade. It is reasonably certain that ships' net tonnage as a rule is not now more fully laden than in 1914 and the average loading is probably somewhat less, although the increase during the decade in ships specially built to carry oil or ore in bulk or to carry in refrigerated spaces meat, fruits, and vegetables has permitted the fuller use of ships' carrying capacity in certain lines of trade. The amount of the world's tonnage out of employment points to this conclusion, though it must be noted in considering 1923 returns that the world's shipping laid up in June, 1924, was 5,000,000 tons less than at the beginning of 1922.

Ships' Tonnage Movement with Cargo

The tonnage of ships carrying cargo or cargo and passengers which entered and cleared in the foreign trade of the United States may be accepted, then, as an approximate measure of the volume of that trade. The net tonnage of such ships for the fiscal years 1904 and 1914 shows the normal increase during the decade before the war; the net tonnage of such ships during the calendar year 1923 compared with 1914 returns affords a measure of the increase for nine and one-half years after the declaration of war; and the net tonnage of such ships during the calendar year 1922 compared with the 1923 figures permits an estimate of the revived rate of progress in trade and transportation.

The total increase in laden net tonnage in the decade before the war was about 35,000,000 net tons, of which 19,000,000 net tons were clearances with exports, between 1914 and 1923 the total increase was barely one-half—18,000,000 net tons, of which only 7,000,000 net tons were export clearances. The total increase of 1923 over 1922, however, was 3,000,000 net tons, and as import entries showed a decrease, export clearances for 1923 over 1922 were more than the corresponding pre-war average annual increase.

Safety At Sea

THE Annual Report of George Uhler, Supervising Inspector General of the United States Steamboat Inspection Service, shows that the vigilance of his service and the ingenuity and efficiency of American life-saving appliances have combined to make sea travel synonymous with safe travel.

Of 344,658,611 passengers carried on the steam vessels subject to the rules of the United States Inspection Service, only 54 lost their lives through accident. The number of lives directly saved through life-saving appliances was 620. The record of one passenger lost out of about six and a half millions carried would be, we think, difficult to match in any other mode of travel.

These figures show such a small opportunity to increase the percentage of safety by additional life-saving appliances that both governmental agencies and owners of vessels are turning rather to the prevention of accident to the ship, or safety in navigation.

The most important development along this line in recent years is the establishment of a system of radio beacons at lighthouses and on lightships; and in this development the United States leads the world, both in the number of installations and in the quality of the apparatus.

Fourteen additional beacons are to be installed in the near future. Six of these will be on the Great Lakes; two more will be placed on the Atlantic Coast, in addition to the eight already operating there; two will serve the Gulf Coast; and four more will supplement the four now operating on the Pacific Coast.

These eight radio beacons on the Pacific Coast will make it possible for vessels equipped with radio compass to navigate with accuracy in the densest fog. Many owners are quick to realize this advantage among the more recent being the Emergency Fleet Corporation, which has ordered the sixteen passenger liners comprising its first-class passenger fleet to be equipped with the Kolster radio compass as promptly as the installations can be made.

As far as human ingenuity and human vigilance can go, Sea Travel is being made Safe Travel.

POLITICS AND SHIPPING

Society of Naval Architects and Marine Engineers Discuss Government Ownership at Annual Banquet

"UNTIL the politicians awaken to the fact that American shipping cannot be successfully 'Sovietized' and realize that if there is to be permanency in its maintenance and growth, it must come through the individual initiative of American business men and not through government ownership and operations, we are doomed to failure on the seas in foreign trade."

This declaration was made by Ira A. Campbell of the law firm of Kirlin, Woolsey, Campbell, Hickox & Keating, in an address delivered at the annual banquet of the Society of Naval Architects and Marine Engineers, November 12, at the Waldorf-Astoria, which was attended by five hundred representatives of shipping interests from all sections of the country.

"There is the strongest evidence," he continued, "that there has been and, unless the event of the past week has killed it, there continues to be, a concerted effort to involve the givernment in permanent ownership and operation. Of course, there will be denials of this, but nearly every move of recent date by those in governmental authority has been in this direction.

Dollar World Service

"I except one thing, the sale of the passenger ships to the Dollar interests, which has made possible, because Captain Dollar had the courage to undertake it, the finest globe encircling service in all maritime history. Other than this, I question whether any one can point to any act of material consequence by the constituted authorities which is forward looking to private ownership and operation."

Referring to the designation of managing operators, Mr. Campbell declared his opinion that with but few exceptions, excluding the passenger services to South America and the Orient, the government ship operators are not owners of ships and not likely to risk their money in the ships and that the assignments had been made with little regard to the possibility of ultimate purchase of the ships. He referred to the recent severance of a prominent shipping man from operation of government ship services, notwithstanding the fact that negotiations had been opened for the purchase of ships, and declared the hearing held in this connection by the Shipping Board to have been a mere farce.

Ship-Minded Excluded

"Have you heard," he asked, "of the Shipping Board conducting any negotiations with the Luckenbach, or American-Hawaiian, or Harriman, or Franklin, or any of the other great shipping interests, with a view to extending their services and ultimately becoming the purchasers of government ships? Save for three passenger services, and one or two other instances, have you heard of any American shipowners being designated as operators of government ships because of their demonstrated efficiency in their own business and of their potentiality as ultimate purchasers?

"No man can tell the basis of selection, and I doubt whether Admiral Palmer can tell why he has been thwarted in some of his plans. In further example of the trend toward permanent government operation, take the renaming of the various services. The Shipping Board has literally thrown into the discard the name of the Pacific Mail Steamship Company, which for sixty years has been favorably known in the remotest parts of the Far East.

Names Jettisoned

"It has jettisoned the Munson name in South American trade and the Admiral Oriental in the North Pacific, which have come to be symbols of good services, under the pretense of building up for the government a good will which it can sell. The fallacy of the pretended motive is self-evident. There can never be any good will of any value in the services until after the business is on a basis where the ships can be made to pay.

"The moment they reach that condition sound business judgment will justify their being taken into private ownership on the basis of their then values. This is true of the freight as well as the passenger services. Destruction of the individuality of the operator may help to establish the government more permanently in the business.

Critical Survey Needed

"How can this attempt to involve the government permanently in the shipping business be stopped? By a full disclosure of the financial results of government operation, such a public accounting as will actually and fully disclose the true results of the operations. You will never, however, see such a disclosure voluntarily made by the Shipping Board. Neither are you going to have a revelation of such information as the result of the investigation by the present subcommittee of Congress.

"In my judgment it can be obtained only through an investigation by men who know the business and who will make a critical survey of the operations regardless of the antipathies they may incur."

Change Shipping Board

The Shipping Board, Mr. Campbell declared, has demonstrated that because of its size and its repre-

sentation of geographical sections, it can never function efficiently. He suggested that it should be replaced by a board of three men, chosen for their fitness, directly responsible to a member of the Cabinet, preferably the Secretary of Commerce, and sitting as a board of directors to one operating head who should have absolute freedom of action.

In order to establish the merchant marine on a paying basis, he added, our laws must be revised to put us on a parity with our competitors, especially the laws in regard to seamen's wages and the language test. He also advocated mail contracts for strategic passenger services and and, above all, the working out of a plan through which men of experience and financial capacity can take over the services that are to be maintained.

James A. Farrell

Privately-owned shipping in this country, James A. Farrell, president of the United States Steel Corporation, told the members of the Society of Naval Architects and Marine Engineers at their annual banquet in the Waldorf-Astoria, cannot be profitably operated while the Shipping Board continues its policy of keeping rates at low levels at the expense of the taxpayers of the country. Ocean freight rates at the present time, he declared, are as low as they were in 1908. Ocean rates on steel from Atlantic and Gulf ports to Europe, he added, are lower than the rail rates from Pittsburgh to New York.

The policy of the Board in regard to dieselization of laid-up steamers, however, came in for hearty commendation by reason of the fact that it has given an impetus to the engine-building industry. Already, he said, the example of the Board has been followed by one shipping company, which has decided to build four 10,000-ton cargo ships with diesel engines.

Cooperation Needed

Referring to the need for a constructive national policy on shipping, Mr. Farrell said the nation can, of course, control its own cargo, but reminded his hearers that adoption of any discriminatory policy will make it impossible to get homeward cargoes. There must be more cooperation, he said.

Application of the coastwise shipping laws to the Philippines, he said, was a legitimate proposition and would give employment to a large proportion of the laid-up tonnage of the Shipping Board. As to the prospects of building up American overseas trade, he said:

"As long as American manufacturers sell f. o. b. instead of c. i. f., America is not going to get a fair share of cargoes."

Operating Costs

Turning to the operating cost of American ships as compared with those under foreign flags, he said: "With the exception of wages, the operating costs of foreign ships do not differ from those of American ships." He intimated that this handicap might be overcome with the aid of a proper national shipping policy and compared the state of American shipping with that of Germany, which, after being virtually wiped out by the world war, has come back to fifth place and bids fair to be in third place inside of two years.

"The United States," he said, "is helping other nations to get on their feet, but I think our naval and merchant fleets should be maintained at such efficiency that other nations can't get on our backs."

Decline of Shipbuilding

Brigadier-General William Weigel referred to the decline of shipbuilding in this country so that we have fallen back in sixth place, leaving the nation at a serious disadvantage in time of emergency. He predicted great advances in airship development and said we might expect to see many air routes established and doing a profitable business in the next ten years.

Rear Admiral Plunkett, called upon to speak for the Navy in the absence of Secretary of the Navy Wilbur, said the news that the government was going ahead with the building of new light criusers was the best he had heard in a long time. He advocated a 5-5-3 policy for the merchant marine, so that the nation might carry at least 50 per cent of its own trade.

Other speakers were Rear Admiral David W. Taylor and Stevenson Taylor, president of the American Bureau of Shipping.

MARINE ACTIVITIES AT WASHINGTON

Special Correspondence, Pacific Marine Review

WITH the passing of the elections attention is obviously turning again to the problem of a permanent merchant marine policy, and interest will probably again be centered upon it during the forthcoming Congress. There have also been some indications that it will be one of the subjects with which President Coolidge will deal at the outset of the new term.

The Chamber of Commerce of the United States has already raised the question, including it among the subjects upon which it has asked for legislation, in a communication to the President. Calling attention to conditions as they now exist, it says: "The Chamber of Commerce of the United States does not feel that present policies and administration of the merchant marine are on a sound business basis calculated to promote the growth of an American merchant marine.

"Its earnest advocacy of an American merchant marine cannot be questioned. By referendum and resolution it stands committed to policies of subsidy, mail subvention, private as against government ownership and operation, and most strongly against government operation in competition with private operation which depresses private investment and initiative in this important field.

"It is unable to find, in existing law, warrant for

policies of operating ships for purposes of competition or otherwise at a continuing deficit, while, on the contrary, it finds explicit statement of policies of transfer to private ownership as quickly as practicable, and for operation in the meantime only where there is profit or where continued operation holds out a fair prospect of future profit.

"To make possible the transfer of the government fleet to private ownership, we are convinced that the war cost of this fleet must be marked off and that its real value is not to be arrived at by original cost and application of depreciation, but by what the ships will bring in the market.

"It finds present policies undetermined and vacillating, making extremely difficult any dependence upon American bottoms for shipping abroad because of uncertainty regarding the future plan of operation, and it believes that more definite authority in regard to policies and their maintenance than that now furnished by the Shipping Board as at present constituted with seven members would materially advance the situation which the present confusion of executive and regulatory functions hinders."

Shipping Board Pains

As a corollary to the larger question of a permanent and adequate merchant policy, it is also regarded as probable that the President will give attention to the more or less turbulent conditions prevailing in the Shipping Board itself. Shipping Board activities have been hanging fire somewhat pending the elections. The Board is now preparing to take up various important matters which have been held back. Among other things to be considered are Pacific Coast conditions upon which Commissioner Lisner, who will return to Washington on November 17, will make a report.

But the principal question which confronts the President is the obvious friction between Admiral Palmer and the members of the Board. On the part of the Board, the prediction is made that differences will be composed and a more harmonious policy worked out, but there is a well defined suspicion that President Coolidge will take decisive action, if necessary, to attain this end, and that there will be changes in the personnel of the Board which will result in bringing about more conformity between its views and the views of Admiral Palmer.

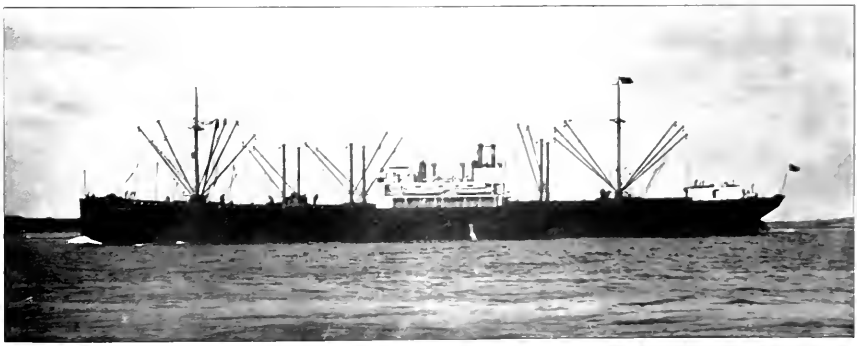
Merchant Marine and Fisheries

The chairmanship of the Committee on Merchant Marine and Fisheries of the House, which will play an important part in the affairs of the next Congress if the merchant marine question is to be taken up again, will probably go to the Great Lakes region as a result of the election changes. Representative Edmonds of Pennsylvania, who in the order of seniority is in line for the chairmanship, is not disposed to sacrifice his place on the Committee on Claims. The merchant marine chairmanship, therefore, will go to Representative Frank Scott of Michigan. The change might be made with the present session of Congress. Mr. Edmonds, it is understood, is willing to yield place to Mr. Scott, in view of the reconstitution of the committees of the next Congress. Mr. Scott is classed as a regular among the Republicans and has always taken an active interest in merchant marine matters.

Only negligible changes will occur in the Senate Committee unless there is a change in the methods of organizing Congress and appointing committees in view of the inclination among the regular Republicans to disregard the claims of the Progressives as party adherents.

Guam Line

The Navy Department has approved the arrangement made by the Dollar Line for the maintenance of a regular service with the Island of Guam, and the first sailing, as announced, will be that of the Stuart Dollar (which has been loading at Philadelphia, Baltimore, and Norfolk) from San Francisco on December 10. The new arrangement, which has been sought by the Guam Chamber of Commerce, will give the island a continuous service with fifty-day intervals.



A modern freight carrier. The United States [illegible] a fleet [illegible] these in the near future

NEW YORK OPTIMISTIC

Eastern Shipping Men Feel that Election Guarantees More Common Sense and Less Politics in Consideration of Shipping Problems

By PATRICK McEVOY

VARIOUS suggestions for the formulation of a strong and clearly outlined national shipping policy have engaged the attention of Eastern shipping men in the last few weeks, and the general attitude of all of them was well summed up by Winthrop L. Marvin, vice-president and general manager of the American Steamship Owners' Association, in his address at the annual banquet and meeting of the American Marine Congress in the Waldorf-Astoria Wednesday evening, November 12, when, speaking of the results of the national election, he said:

"The great victory won by President Coolidge in the recent election has been the best thing that has happened to American shipping in the past twenty-five years. The President, like all New Englanders, has a strong love of the sea and a consequent aptitude for dealing with the problems of the merchant marine, the results of which will be seen in due time. His keen interest in the shipping question has been shown in his selection of the members of the special committee on coordination of rail and water transportation.

"The personnel of this committee is an assurance of careful consideration of the subject from all angles, and the history of President Coolidge's career in politics is likewise a guarantee of careful weighing of the findings of the committee before he decides upon the course to be adopted. When the President gets ready to speak, he will speak decisively, but he is not to be hurried. And, another thing, he will have a united party behind him, so that what the President and his Cabinet may ask of the new Congress they are likely to get."

Shipping men who were questioned as to what effect the death of Senator Lodge might have on future shipping legislation in the upper house of Congress expressed the belief that, while Senator Lodge had been a keen student of shipping affairs and an advocate of all effective measures introduced in aid of the merchant marine, the overwhelming victory won by the President makes it certain that shipping will not lack friends at Washington during the coming four years.

Marine Congress Recommendations

Much interest has been aroused by the resolution adopted at the National Marine Congress recommending that President Coolidge be asked to submit to Congress such recommendations as he may deem best for the benefit of shipping through application of the principle of the protective tariff. Advocates of the measure, when asked whether it was intended to commit Congress to the enactment of either a discriminatory tariff or a subsidy measure, stated that the purpose was merely to bring to the attention of the President the urgent need for some form of national aid to put the industry on its feet and maintain the merchant fleet on a plane consistent with its importance as a factor in the national defense.

Discriminatory Tariffs Out

Most shipping men appear to be of the opinion that discriminatory tariffs or preferential rail rates are out of the question as aids to shipping, because of the certainty of resultant claims of flag discrimination and possible adoption of annoying retaliatory measures which might take many forms. It is not believed there is any likelihood of a revival of the effort to enforce Section 28 even in connection with trades in which there is an adequate supply of American flag tonnage for cargo movement.

Subsidy Hope

Many still cling to the idea of a subsidy either in the form of a mail subvention or on a tonnage basis, applicable to both passenger and cargo vessels. Advocates of this plan point out that the subsidy measure of two years ago was defeated by a filibuster, instead of being considered on its merits. It is further held that were such a measure adopted and the Shipping Board fleet turned over to private owners there would be less difficulty in building up strong patriotic sentiment in favor of American flag shipping which would make it possible in a comparatively short time to dispense with a subsidy.

Navigation Laws

During the past week the text of the report of the American Steamship Owners' Association's special committee on revision of the navigation laws was turned over to the legal advisers of the association for review preparatory to its submission to Congress. This action was taken at the quarterly meeting of the association, at which the quarterly report of President Alfred Gilbert Smith was presented.

The report of the committee, of which Captain Eugene E. O'Donnell, vice-president and general manager of C. H. Sprague & Son of Boston, is chairman, embodies in detail the changes which the association regards as necessary in the shipping laws and rules as they appear in the tentative text of the recodification prepared under the auspices of the Shipping Board.

On motion of Frank C. Munson, president of the Munson Steamship Line, the report of the committee was approved unanimously with a vote of thanks to the members, who, in addition to Captain O'Donnell, are: Captain Asa F. Davison, general manager of the marine department of the United Fruit Company, Boston; Robert F. Hand, assistant manager of the marine department of the Standard Oil Company (New Jersey); A. S. Hebble, superintending engineer of the Southern Pacific Company; A. J. McCarthy, manager of the American flag steamers of the International Mercantile Marine Company; and J. D. Tomlinson, vice-president of the American-Hawaiian Steamship Company.

In his report on the activities of the association during the quarter, President Smith stated that on the initiative of the tank steamer committee a formal request has been made to the classification societies for the granting of a differential load line to vessels carrying oil in bulk. This policy has already been approved by the American Bureau of Shipping, it was stated, and is to be taken up at a meeting of a special sub-committee of Lloyd's Register of Shipping in London, at which J. R. Gordon of the Union Sulphur Company will represent the association.

GROWING UP WITH HAWAII

Progressive Policies Formulated by Captain William Matson Continue Today; Fifteen Ships Link San Francisco with the Happy Isles

By ARTHUR E. BIXBY

HAVING lived in Hawaii "off and on" for five years, the writer of this brief sketch, like all others who have had the good fortune at one time to reside in "The Happy Isles," cannot refrain from telling the world, whenever and wherever he gets the chance, of the beauty and charm of those lovely islands 2091 miles southwest of San Francisco.

"The Hawaiian Islands, crossroads of the Pacific," says Dr. Gilbert Grosvenor, LLD., editor of the National Geographic Magazine, "are one of the wonderlands of the globe. . . . Nature conceals in them more of her mysteries to attract and chain the attention of the student and more of her masterpieces to enrapture the visitor than in any similar area."

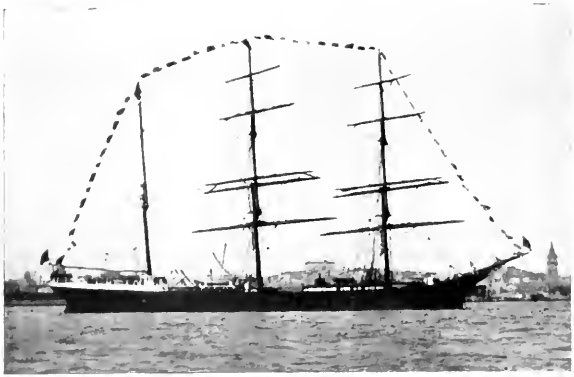
BEAUTIFUL HAWAII

A faint idea of the charm of the "Paradise of the Pacific" is given by the three views on this page. Above, we show a Hawaiian sugar plantation. At the left, sunset over the rice fields near Honolulu. Below, sunrise on Hilo Bay, taken in the 'nineties, showing the old Matson fleet of windjammers, the brig Lurline and the bark Annie Johnson.

Schooner Emma Claudina

Forty-two years ago, back in 1882, when the late Captain William Matson, founder of the Matson Navigation Company, started out with his first ship, the 200-ton schooner Emma Claudina, to carry general merchandise from San Francisco to Hilo and bring back raw sugar, hides, cocoanuts, grain, and other island products, the Hawaiian Islands were hardly known and their agricultural wealth had not more than begun to develop.

Today Hawaii's sugar plantations produce 700,000 tons of sugar per year, her pineapple pack is 6,000,000 cases annually and will go to



The Matson sailing ship Andrew Welch in San Francisco Bay July 4 1909

8,000,000 within the next five years, and her climatic and scenic charms, entitling her to the title of "the year-round playground," are bringing more than 12,000 tourists a year, not only from the mainland United States, but from the Orient, Australasia, and Europe.

Foresight in abundance was an outstanding characteristic of Captain William Matson. He believed in the future of San Francisco and the Hawaiian Islands. Starting in with one little sailing ship, he lived to see steam replace sail in the Hawaiian trade and his fleet grow from one small vessel to the largest privately-owned American tonnage in the Pacific, consisting of six passenger liners and nine cargo ships.

Service and courteous treatment of freight shippers and the traveling public were placed paramount by Captain Matson, and his ideals and progressive policies live today in the Matson Line, whose splendid new building, occupied on January 17, 1924, at 215 Market street, San Francisco, is a monument to his career. On October 1, 1921, the Matson Line's Honolulu agency, Castle & Cooke, Ltd., moved into its splendid new building, also a tribute to the faith in Hawaii possessed by the captain and his associates.

Round the Horn

From his early days, Captain Matson was a hard worker. Born in Lysekil, Sweden, on October 18, 1849, he began his seafaring career at the age of ten, and came to New York when fourteen. In a few years he determined to come to California, so he signed on for a voyage, going as a sailor goes—around the Horn—to San Francisco. He won his master's papers at the age of 21, and his first command was a San Francisco Bay schooner. When his own line had grown to several ships he still worked early and late, coming down to the office again after closing hours the night before sailing day and worked there as late as any of his freight clerks.

From the start, Captain Matson's venture in the Hawaiian trade was a success. The Emma Claudina soon became inadequate. The captain then built the brigantine Lurline in 1887; purchased the bark Harvester in 1890; and acquired the Annie Johnson in 1893. The bark Santiago was purchased in London in 1894, the Roderick Dhu in 1896, the Falls of Clyde and Antiope in 1899 or 1900, the Marion Chilcott in 1901, and the Montreay the same year.

Two Matson steamers, the Mahukona and the Manukai (right) lying at Kahului harbor.

Commodore Peter Johnson, one of Captain Matson's first captains and now commander of the flagship Maui, relates that the Harvester, which he commanded, the second ship purchased after the Emma Claudina,

carried ten passengers and had a crew of thirteen men. The steamship Maui, the Matson Line's present largest passenger liner, carries 274 passengers and has a crew of 152.

Oil On the Side

While adding to his holdings as a shipowner, Captain Matson went into the oil business in California as a side line. He developed desert lands into rich producing fields, built the first oil-carrying pipe line from wells to seacoast in California, and constructed some of the first oil delivery stations along the Pacific Coast and as far north as Nome, Alaska. To supply these stations he purchased the steamship Rosecrans and converted her into an oil tanker. As a director in several Hawaiian sugar plantations, Captain Matson substituted oil as fuel, replacing coal. Today no Hawaiian plantation uses coal. Captain Matson founded the Honolulu Consolidated Oil Company, which with the Matson Line is one of his life monuments.

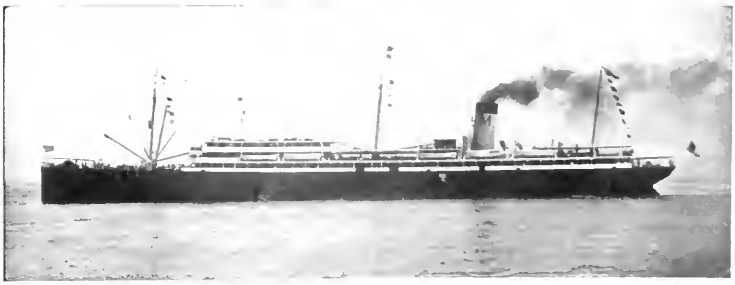
A Matson steamer loading sugar from an Inter-Island steamer at Honolulu

Foreseeing the coming superiority of oil fuel for steamers, Captain Matson then purchased his first steamer, the Enterprise, in 1902, and at once converted her into an oil burner. This was the first installation of its kind on the Pacific. Radio, now a commonplace, was then just coming into use. The captain equipped the Enterprise with wireless, also the first set on a Pacific steamer.

Hawaiian Growth

During these years the Hawaiian Islands, as Captain Matson had foreseen, increased in population and agricultural wealth so rapidly that Hilo lost place to Honolulu as the terminus of the Matson Line, which by that time found it necessary to add another steamer. In 1908 the steamer Lurline, named after Lurline Matson, now Mrs. W.

Pineapples are Hawaii's second largest crop. Most of the pack is carried to the Pacific Coast by the Matson liners.



The two largest steamers of the Matson fleet, steamer Matsonia, leaving San Francisco for Honolulu, at the left; steamer Maui, at the right. Each of these steamers carries 275 passengers and 10,000 tons of cargo.

The Matson steamer Lurline, leaving Honolulu harbor. The Lurline was the first steamer built by Captain Matson. Three years ago she was completely rebuilt and modernized.

P. Roth, wife of the company's general manager, was completed. She was the first ship built for the Matson Line, and made her first voyage to Hawaii in June, 1908.

That year and the next saw a program of further expansion in the Matson Navigation Company. The Planters' Line of sailing ships was purchased, and the steamer Wilhelmina, named after Wilhelmina Tenney, daughter of E. D. Tenney of Honolulu, president of the Matson Line today, was ordered. The sailing ships were then taken out of service and made into fuel oil carriers. Today the motor schooner Annie Johnson is the last Matson windjammer remaining in service.

So steadily did commerce between Hawaii and San Francisco increase that the five Matson steamers then in service (the Enterprise, Lurline, Hilonian, Hyades, and Wilhelmina) were unable to handle all the business offered. Consequently in 1912 the Matsonia, one of the line's present two largest passenger ships, carrying 225 passengers and 10,000 tons of cargo, was ordered, the Manoa, an intermediate steamer, following a few months later.

Passenger Travel

Passenger travel from San Francisco to Hawaii grew apace with the years, and Matson ships became so popular with the traveling public that in 1915 the steamship Maui, sister ship of the Matsonia, was ordered, making her maiden voyage to Honolulu in the spring of 1917.

The Maui was Captain Matson's pride. I met the steamer upon her arrival at Honolulu, on a wonderful morning resplendent with the bright sunshine and fleecy clouds so typical of Hawaii. Captain and Mrs. Matson made the trip on that initial voyage, and Captain Peter Johnson commanded the liner. In many ways I think it was the proudest moment of Captain Matson's life when his newest and largest ship steamed into port in those islands to which thirty-five years before he had come with one little schooner, the Emma Claudina, of 200 tons. The Maui is of 17,250 displacement tons.

Then came America's entry into the world war, and again Captain Matson's foresight in having had the Maui, Matsonia and Wilhelmina so constructed as to be easily convertible to transports, was proved. These ships had been built with gun foundations, double steam and water lines and deep double bottons in which were carried more than 600,000 barrels of fuel oil per year over the amount required by the steamers on the round voyage from San Francisco to Honolulu, including the side-trips to Hilo and Kahului. Captain Matson was one of the first American steamship owners to offer his fleet to Uncle Sam. The Maui made thirteen trips to France and back, carrying 37,344 troops; the Matsonia fourteen, carrying 38,974; and the Wilhelmina thirteen, carrying 23,014.

That year, so fraught with portent for the United States, was destined to be Captain Matson's last. Worn out by his constantly growing steamship business, his oil activities, and his interest in war work, he suffered two strokes of paralysis, the last resulting in his death, on October 11, 1917.

Although Captain Matson has passed on, his progressive spirit and policies of service to the public and a square deal for all employes have been kept alive by the Matson Line's management, which today is striving just as hard to improve its service and achieve greater efficiency as in the days when the Captain was at the helm.

Since Captain Matson's death further increase in the size of the Matson fleet has been made necessary. Two freighters, the Manulani (Bird of Paradise) and Manukai (Bird of the Sea) of 14,000 tons freight capacity each, were completed in 1921 and are the largest cargo ships in the Hawaiian trade today. Increase of Hawaiian trade also made it ad-

Matson liner Matsonia photographed from the Maui at sea, 1045 miles from the nearest land.

Matson liner Maui returning to Honolulu in her war paint.

visable to purchase three 4200 d.w.t Lake-type freighters in the spring of 1922. These were renamed Mahukona, Makaweli, and Makena. During 1923 the company purchased two more cargo ships of a larger size, carrying 9000 tons of cargo each. They have been renamed Mauna Ala (Sweet Mountain) and Makiki, after a valley of the latter name in Honolulu. All Matson ships built or purchased since 1912 have been given Hawaiian names starting with the letter "M", thus signifying the Matson Line's close relationship with the commercial and agricultural development of the Territory of Hawaii, U. S. A.

Within the last three years the Matson Navigation Company has established a modern cafeteria at its docks in San Francisco, to feed its stevedores, ship personnel, and executives at Piers 30 and 32. A laundry was opened two years ago, to handle all linen from the passenger and freight ships. It not only washes this linen, but repairs it so that it may be used on the freight ships after it has become unsuitable for longer use on the liners. The company also now has on its piers a complete carpenter shop with motorized machinery, a battery-charging plant for its electric cargo, handling tractors, a complete storeroom and supply room containing everything from coffee cups to steam valves, and many other features.

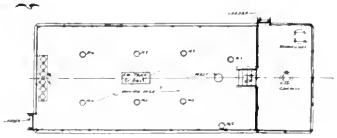
Personnel Policy

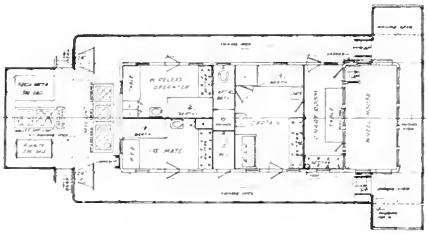
Recognizing the desirability of a permanent seagoing personnel, in which changes would be reduced to a minimum, the Matson Line in the spring of 1923 established a system of continuous service bonus for employes afloat. Under this plan, every officer and man of the fourteen ships now in commission receives each Christmas a bonus based on length of service. The bonus starts with a base rate according to departments and increases each year for ten years, when the maximum is attained. In the case of captains, the bonus payment for ten years or more of service is $600; for chief engineers, $540; chief officers, $540; and so on down the line. As each man is promoted his base rate of bonus increases accordingly. "Promotion is open to every man in the company who deserves it," says W. P. Roth, general manager, "and who keeps himself fit and qualified to take the next job ahead of the one he holds."

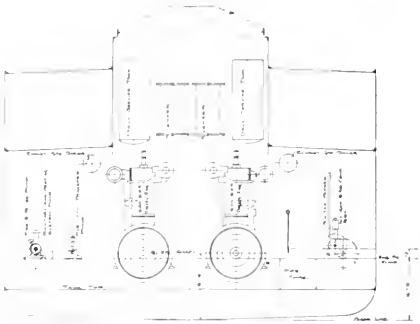
As a further means of promoting efficiency and insuring more friendly relations between the executive personnel in San Francisco and the port superintendents in Hawaii, the Matson Line in August of this year held a week's conference in San Francisco which was attended by the port captains not only from its ports of call in Hawaii, but from the Puget Sound and Los Angeles agencies as well. E. D. Tenney, of Honolulu, president of the company, in addressing the conference, stated that "the Matson Line's position today is a product of the showing you men have made. . . . This meeting is but a forerunner of the annual conference of all our port officials to be held in San Francisco; and the earlier spring conference in Hawaii is to be repeated in Honolulu in 1925 with Matson representatives present both from the coast and the various Island ports. . . . Bringing you gentlemen together like this results in a spirit of good fellowship and the realization that the fellow at the other end isn't such a bad sort after all. Efficiency is the outgrowth of mutual understanding, cooperation, good fellowship in helping the other fellow and the other fellow helping you. There is always room for improvement."

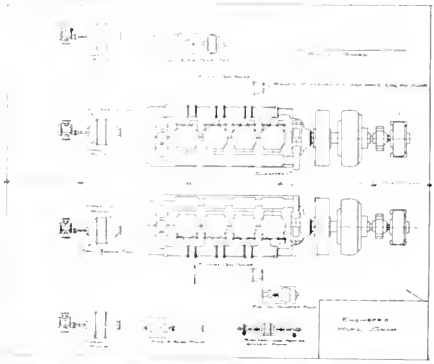
Because of the constantly growing passenger traffic to and from Honolulu, the Matson Line is now nearly ready to start construction of a new express liner, fastest, largest, and finest of the Matson fleet to date. A description of this new liner will be found on another page of this issue of Pacific Marine Review.

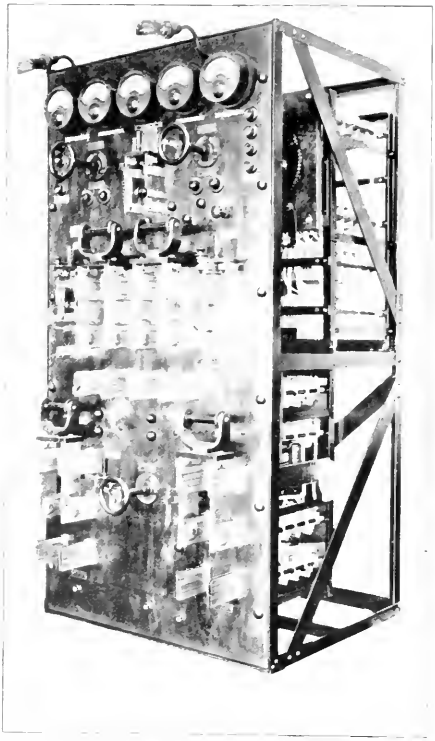
Steamer Jay at Honolul.

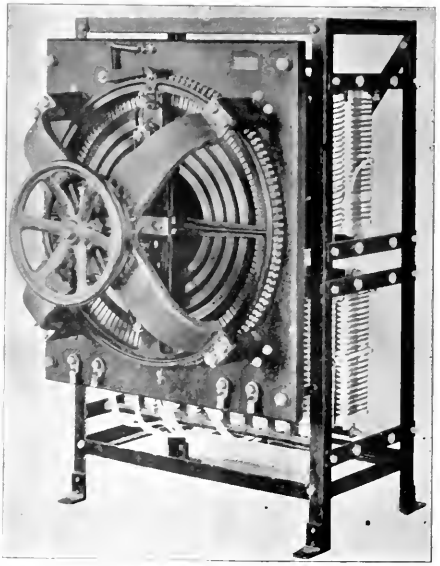




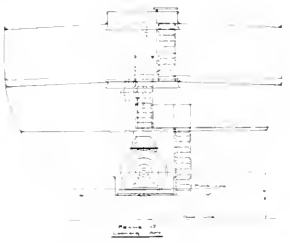








Top left, plan of deckhouse and bridge, Hawaiian Standard. Top right, section through engine room. Center right plan of engine room. Lower left, main switchboard panel. Lower right controlling rheostat.



Section through motor room, Hawaiian Standard.

engine room a double bottom is fitted, arranged for fuel oil bunkers. There are seven double cargo tanks with cargo piping arranged so that nine different combinations of cargo are possible. This piping is figured to load and discharge four distinct grades of cargo simultaneously without danger of mixing. Cargo tanks No. 2 and No. 3 are fitted with a coffer dam between because they are designed to always carry different grades of oil. Each of the four cargo discharge pipe lines is provided with one point of discharge forward, one midships, and one over the stern. This arrangement keeps the after deck and the deck alongside the expansion trunk amidship as clear as possible for the stowage of cargo.

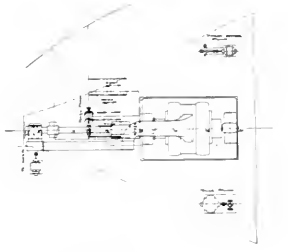
The engine room on the Hawaiian Standard is certainly a power station afloat. The two main generating sets, together with their exciters, practically all of the auxiliary equipment, and the cargo pump motors are all located in this space. The main engines are of 400 brake horsepower each. They are of the 4-cylinder non-reversible type built by the Pacific Diesel Engine Company, Oakland, California, and operate at 225 revolutions a minute. They are each direct connected to a 245 kilowatt 230 volt generator and a 30 kilowatt 115 volt exciter. The diesel engines are fitted with attached pumps for circulating water, bilge water, and lubricating oil.

These two generating sets furnish power to drive the 600 horsepower 460 volt propulsion motor operating at 130 revolutions a minute. The generators, exciters, propulsion motor, and control equipment are built by the General Electric Company. The control is through the Ward Leonard system, the general arrangement of connections being as indicated in the diagram reproduced herewith. In this system regulation and reversal of the propulsion motor is accomplished by the variation or reversal of the field current of the main generators.

The diesel engines run at constant speed and in the same direction at all times as long as the vessel is in operation, and the load on the engines is entirely taken care of by the governing equipment. The engines are designed to regulate within a speed variation of four per cent with a load change from full load to no load, or from full ahead to full astern, in 3 to 5 seconds, which is about the time it takes the navigating officer to move the control handle. That this condition is actually accomplished has been proved in the operation of the present diesel-electric vessels of the Standard Oil Company, and the engines will take care of these severe conditions so well that not even a flicker of the lights can be discerned. The value of such flexibility will no doubt be fully realized.

The Propulsion Motor

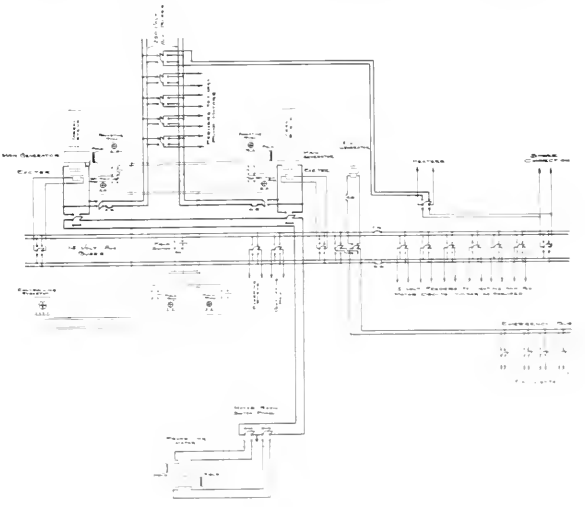
The general construction of the propulsion motor is indicated in the illustration, which shows the unit assembled. The flange at the end is connected directly to the thrust shaft, and a separate Kingsbury thrust bearing is mounted directly aft of the motor. The ventilating duct shown in the center of the unit is connected to the discharge of the ventilating blower, which is located in the upper motor room,



Plan showing arrangement of machinery in motor room.

taking air from the steering engine space and discharging it to the propulsion unit as shown. The air passing through the armature and over the communtators at each end also provides a very efficient means for ventilating the motor room. Temperature relays are provided in the bearings of the motor, which will warn the engineer in the engine room should the motor bearings, which are flood lubricated, for any reason heat up.

Actual experience has shown that with this controller it is possible to vary the propeller speed from 1 to 130 revolutions per minute within the period of 7 seconds. It is also possible to keep running indefinitely at any speed from one revolution per minute up. This controller is directly geared to a control stand



Simplified schematic diagram of connections for Ward Leonard system of control as installed on Hawaiian Standard.

in the pilot house, and the propeller speed is at every moment in full proportion to the position of this control lever.

The illustration showing the main control board gives an idea of the simplicity of the entire arrangement. With the switches set as indicated in the illustration, the control of the vessel is entirely up to the captain, as the main controller can not be operated from the engine room. If anything happens that should make it necessary for the engineer to cut out one of the engines, a generator, or one-half of the motor, he has only to open the small switch at the top, which kills the entire propulsion unit. After this is done any unit is cut out by throwing any of the four large switches into the lower position and then closing the top switch. This again puts the equipment directly under the control of the captain with the one unit cut out, whether this be a motor armature or a generator. This whole operation is accomplished in only a few seconds.

The main generators are also equipped with a differential winding, because of which it is impossible to put more than a 50 per cent overload on the generators, as an increase in the main line current above normal will cause the terminal voltage of the generator to fall off to such an extent that it is impossible for the current to increase beyond this point. This is of particular advantage in reversing the propeller from full ahead to full astern, in which case a severe overload condition would otherwise take place, which might open the main circuit protective device. This special winding on the generators, however, makes it unnecessary to provide circuit opening protection in the main line.

As indicated in the wiring diagram, all auxiliary equipment except the four main cargo pumps is 115 volt, and supplied with power by the two 30 kilowatt exciters. The cargo pumps, however, are 230 volt and supplied by the main generator. For this condition the field switches on the generator are arranged with double throw. If this switch is thrown in the lower position, the main controller operated from the bridge has no control over the generator voltage, which is then controlled from a rheostat operated by the handles shown in the upper portion of the control panel. However, it is also possible to use the cargo pumps when the ship is under way, provided it is not subject to maneuvering. Thus it is possible to ballast the ship while going full speed, in this way avoiding delay for the purpose of ballasting.

As shown in the wiring diagram, the steering engine ventilating fan and excitation are taken off the exciters without any overload circuit breaker protection. Such protection, however, is installed ahead of the taps to all other auxiliary machinery. This is to insure that a short or ground on the auxiliary circuit will not affect the main propulsion equipment, and still will give full protection from overload or shorts on the other auxiliary circuit on which such condition is most likely to occur.

The vessel is also equipped with one small gas engine driven auxiliary generator and compressor set, consisting of one 7 horsepower Union gas engine and a 2-stage Rix air compressor. This set makes it possible to fill the starting air and injection tanks on the engine should the air for any reason be lost. It also supplies all necessary lights when the vessel is laid up and it is not necessary or advisable to keep one of the main engines running when nothing but lights is required.

The other auxiliary machinery of the vessel consists of:

1 fire and bilge pump,
1 sanitary and heating service pump,
1 fuel oil service pump,
1 fresh water pump,
1 refrigerating machine,
1 motor room bilge pump,
1 ballast pump,
1 lubricating oil separator,
3 ventilating blowers.

All this machinery is electrically driven and fitted with magnetic control.

Cargo Pumps

The cargo pump room is located just aft of the engine room and the cargo tanks are located 4 forward and 3 aft of the machinery.

The cargo pump motors are located in the engine room, with the shaft extension through a stuffing box in the steel bulkhead into the pump room. This arrangement is similar to that on the motorships Standard Service and Alaska Standard and has proved very satisfactory. By this arrangement the electrical equipment is kept under the observation of the engineer while the pumps are handled by the pumpman. Otherwise it would be necessary to provide explosion proof motors and elaborate forced ventilating system to prevent accumulation of gases in the motors where more or less sparking takes place.

The four cargo pumps are 230 volt, and are operated by drum controllers located in the engine room, with operating handles through the bulkhead into the pump room, and equipped for 33 per cent speed reduction by field control. The cargo pumps are of the rotary type, made by the Northern Pump Company, and are designed to handle 350 gallons per minute at 100 pounds.

The steering engine is of the electric hydraulic type, manufactured by the Hyde Windlass Company and operated by a Bethlehem hydraulic telemotor and fitted with electric helm indicator.

There is also fitted one windlass, two cargo winches, and one capstan, all motor-driven, of the latest improved design, manufactured by Allan Cunningham Company, Seattle, Washington.

Crew's Quarters

The forecastle deck is extended aft and connected to the bridge deck. A large opening is provided forward of the bridge deck houses in order to prevent any accumulation of gases from the cargo tanks, and also for providing light to the main deck space below. The shell plating is also extended aft to the bridge, which makes the vessel extremely suitable for ocean service.

All officers and engineers, as well as the galley and messrooms are arranged in quarters fitted on the bridge and upper bridge deck, space between main and bridge deck is open, insuring ample air circulation under quarters. Very commodious quarters have been provided to insure comfort for the crew in the extreme heat of the tropical climate found in the Hawaiian Island service. All rooms are fitted with electric fans and heaters, and special care has been taken to see that all rooms are amply ventilated.

The crew is housed in quarters fitted under the forecastle, and these rooms are ventilated by a seperate motor-driven blower.

Forced ventilation is also provided to the engine and pump rooms by installing a motor-driven blower in the engine room.

The galley is to be fitted with an oil-burning range of the latest design. Ample sized refrigerating room, with motor-driven refrigerating machine, as well as steward's store room on main deck with direct entrance from the galley, is fitted.

The vessel is also protected by the latest design of Fire Foam fire protection.

SUCCESSFUL WORTHINGTON TEST

New Double Acting Engine Exceeds Expectations on Official Thirty Day Trial Run

A SUCCESSFUL thirty-day, full-power, no-stop test run of the new Worthington double-acting two-cycle diesel-type oil engine came to a conclusion on Saturday evening, October 25, in the Worthington Corporation's Buffalo shops. In the presence of a number of distinguished engineers, representing the United States Shipping Board, the Navy Department, and large private interests, the engine, which had been running under full load at a uniform speed of 90 revolutions per minute since 10:05 p. m. September 25, was stopped at 10:05 p. m. precisely.

The following morning, again in the presence of the Shipping Board and other representatives, the engine was started again, stopped, run in reverse, again run ahead and stopped, handling in every case with perfect ease and precision, although it had not been touched since the end of the thirty-day run.

Following this, the valves were removed, the upper cylinder taken out and lowered to the shop floor for inspection, and the piston and rod also removed for inspection and gauging. One hour and twenty minutes sufficed from the time the engine was stopped to the time when it was entirely open for inspection.

An unusual feature of the inspection was the confidence shown by the Worthington enginers, in permitting the Shipping Board and other representatives not only to be present, but to be first to examine the cylinder, piston, rod and other details after the run. Usually, when such an important and severe test is made of a new engine design, the owners quite naturally prefer to make sure for themselves that everything is all right before inviting guests to inspect the engine interior condition. The frankness with which the Worthington engineers laid all their cards on the table was the subject of much favorable comment by the visiting engineers.

The results completely justified this confidence. The engine, cylinder, liners, piston and rod were all in perfect condition. The piston rings were all as free as when originally put in, and there was not a mark or a score on any surface. Micrometer gauging of the liners and the moving parts revealed no wear at any point exceeding a thousandth of an inch, and at most points less than one ten-thousandth of an inch. There was some soft carbon deposit in the lower edges of the upper exhaust ports, but not sufficient to interfere with the engine operation or decrease its efficiency appreciably. Piston heads and cylinder heads did not even show discoloration from burning. The closest inspection failed to disclose any untoward condition.

It was the general opinion after a searching examination of the engine parts, that the test run could have been continued indefinitely.

Among the prominent engineers who inspected the engine at the close of the test were Captain R. D. Gatewood, U. S. N., chief of the Department of Maintenance and Repair of the United States Shipping Board; Commander Holbrook Gibson, U. S. N., representing the Navy Department; William F. Gibbs, of Gibbs Brothers, consulting naval architect of New York; Vice-President F. P. Palen and C. F. Bailey, engineering director of the Newport News Shipbuilding & Drydock Company; George B. Drake, manager of the Marine Department of the Texas Company; Dr. J. R. Wright, C. O. Rhys and George B. Jones of the Standard Oil Company of New Jersey.

The officially reported results of the test run were as follows:

Duration of test	720 hours
Total number of revolutions	3,879,921
Average speed	89.8 R.P.M.
Average brake load	2400 lbs.
Length of brake arm	15 feet 0 inches
Average brake horsepower	615
Average indicated M. E. P., top cylinder	81 lbs.
Average indicated M. E. P., bottom cylinder	77 lbs.
Average indicated horsepower	778
Fuel oil consumption (average of four 2 hour tests) per brake horsepower hour	0.428 lbs.
Gravity of fuel oil used	28 to 32 Baume
Fuel oil consumption per indicated horsepower hour	0.339 lbs.
Mechanical efficiency measured during the four tests	79.5%
Average lubricating oil consumed in the cylinder and piston rod stuffing-box per 24 hours	4.03 gallons
Average exhaust temperature	510 F.

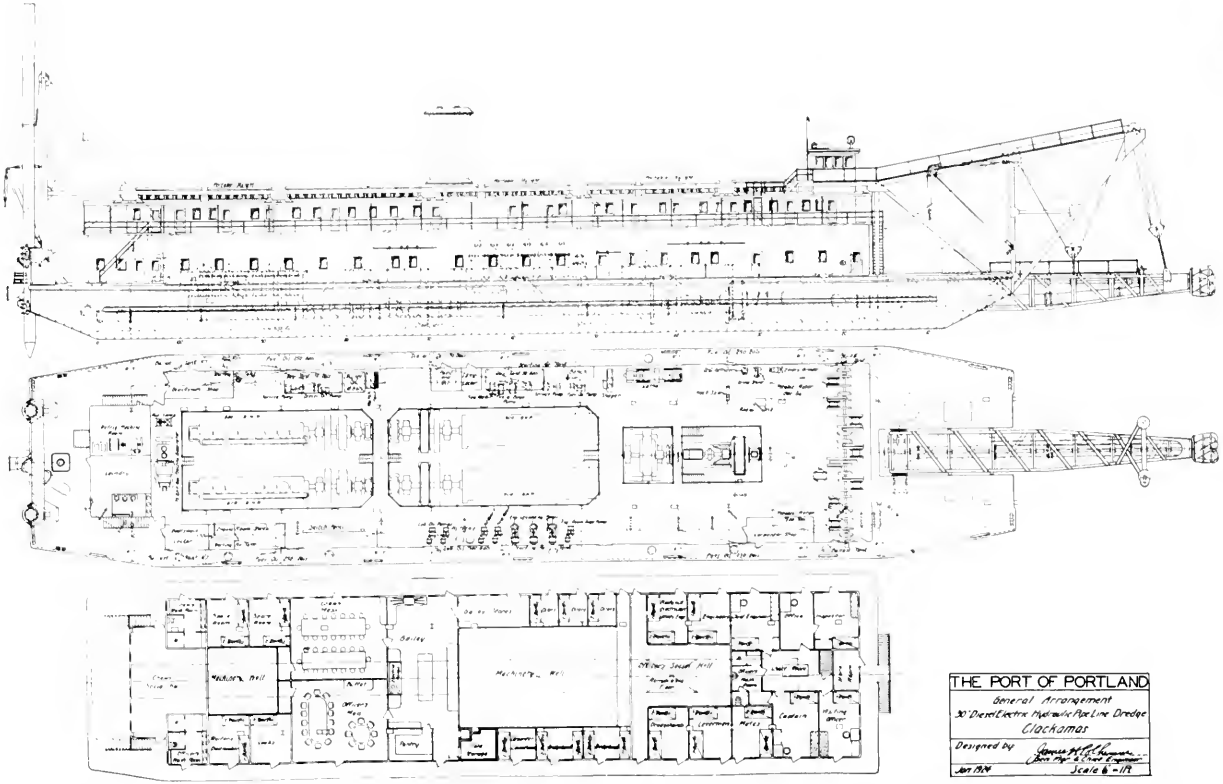
"The engine ran at a steady speed," says the official report signed by Mr. Olson, "without a single stop, during the entire period of the test. The exhaust, investigated close to the outlet from the cylinder, was at all times invisible.

"Readings of temperature of cooling water, exhaust gases, cylinder liners, etc., and of pressures of scavenging air, injection air, oil pressure, etc., have been remarkably steady during the entire period of the test. The running of the engine is as smooth as that of a steam engine, and is marked by an entire absence of harmful vibrations.

"The test has, in our opinion, demonstrated the reliability of this type of engine as far as a thirty-day test could go, and has been entirely successful."

Officials of the Worthington Corporation said that the results of the test even exceeded their expectations, and that the unexpectedly perfect condition of bore, piston and piston rings would seem to indicate that the single walled, steel forged construction for cylinders and heads used for the first time in this engine by Worthington has solved the most serious diesel problem of the past, namely, adequate heat removal and adequate resistance to heat stresses in the material.

In a statement issued immediately after the completion of the test, the Worthington Pump and Machinery Corporation announces that it is prepared to quote on engines of this type, ranging from a two-cylinder engine to develop 1300 horsepower at 90 revolutions per minute, to a six-cylinder engine developing 5600 horsepower at 125 revolutions per minute. These sizes are available in the 28-inch bore cylinder with 40-inch stroke, conservatively rated at 80 pounds indicated mean effective pressure. The corporation is further prepared, it announces, to develop and quote on larger powers, based on the same unique principles of design whose success has now been proved.

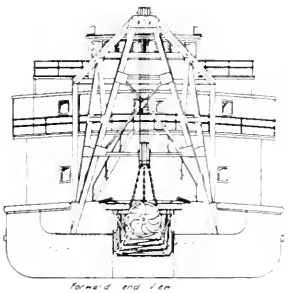


Profile and general arrangement plans of the diesel electric hydraulic pipe-line dredge Clackamas, designed by James H. Polhemus, general manager and chief engineer of the Port of Portland Commission. This dredge is now being built at Portland by the Commission. The illustration is taken from a paper read by James H. Polhemus at the Thirteenth Annual Convention of the American Association of Port Authorities at Los Angeles, October 14.

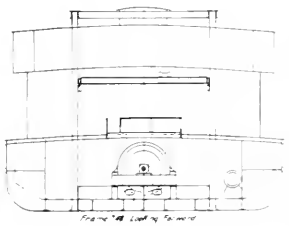
DIESEL-ELECTRIC DREDGE CLACKAMAS

Port of Portland Commission, After Experience With All Other Types of Motive Power, Chose Diesel-Electric as Best Adapted for Continuous Dredging Service

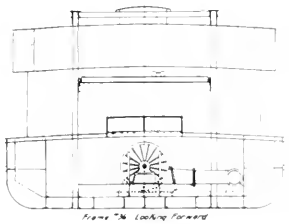
THE Port of Portland Commission, having charge of improvement to channels in the Columbia and Willamette rivers between Portland and the sea, maintain a large dredging plant and have had more experience in hydraulic dredging problems than any other port body on the Pacific Coast. The progress of dredger design by the engineer of this commission always arouses interest. The text of the following description and the illustrations accompanying this article are taken from a paper by James H. Polhemus, chief engineer and general manager of the Port of Portland Commission, read before the convention of the American Association of Port Authorities at Los Angeles.



Forward end view



Profile looking forward



Profile looking forward

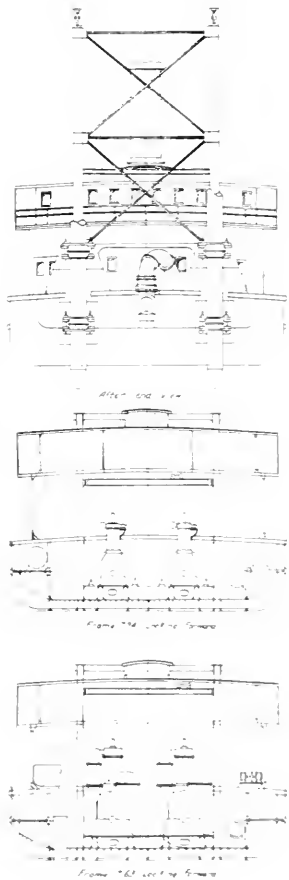
The dredge Clackamas, a diesel-electric unit which is now being built, is the Port Commission's own design, the general and detail plans being prepared by the regular engineering force. In this design consideration has been accorded factors that have been wrestled with in local dredging history to a major extent, with efficiency and economy borne in mind. Among these might be mentioned the remarkable economy of the diesel engine over steam plant. This economy is increased by the elimination of a large boiler room crew and the expense of maintaining a fleet of barges for the handling of hogged fuel, together with the towage service necessary in the barging of the fuel.

The diesel-electric plant is self-contained, having at least thirty days' supply of oil in the tanks in the hull while a steam dredge must always have one large barge alongside, practically doubling the width of the plant and making it very difficult and in some cases impossible to operate in narrow areas, such as per slips. When operating in current, either tidal or river freshet, or in water subject to disturbances by storms and the swell of passing vessels, the fuel barge or barges of which it is sometimes necessary to have two alongside, are a serious impediment.

Steel will be used in the construction of the hull and house, with the exception of the cabin deck quarters for officers and crew. The main power plant will consist of two 900 horsepower and two 800 horsepower McIntosh & Seymour diesel engines, direct connected to electric generators having a combined energy of 2350 kilowatts.

The main dredging pump is designed to be made of exceptionally heavy cast steel and will be direct connected to a 2700 horsepower variable speed, constant power motor having a speed reduction or regulation from 400 to 250 revolutions per minute. Through the speed reduction provision, discharge pipe lines varying from 1000 to 7000 feet in length may be served wth the one size of impeller.

The ladder is to be of structural steel, fitted with heavy cast steel swinging trunnions at the inner end and a revolving cutter at the outer end. The cutter will be of the spiral type, made of cast steel and will be fitted with special knives for cutting hard material. Power for turning the cutter shaft will be furnished by a 250 horsepower variable



After end view

Profile looking forward

Profile looking forward

speed motor. The latter will be installed inside the hull and connected to the cutter shaft through a series of reduction gears. The cutter speed may be anything from 1 to 25.

As to the winding machinery, the usual dredge installation will be followed for the most part. Cast steel of heavy section will be the order and a 75 h. p. variable speed direct-connected motor is to be used on two drums to swing the dredge. A 45 horsepower motor direct-connected to the third drum will raise and lower the ladder independently of the swinging winch. A separate winch will be utilized in hoisting the spuds and handling the stern swinging lines when the dredge is on channel work. The spuds are to be of steel, 35 inches in diameter and 80 feet in length, installed in wells at the rear of the dredge supported by heavy steel brackets with cast steel keepers.

Much thought has been concentrated on the design of the hull because of the great weight of the diesel engines. Heavy steel trusses have been provided to afford increased longitudinal strength. To make the hull virtually non-sinkable it will be divided into a number of watertight compartments. Four longitudinal and four transverse bulkheads are provided with fuel bunkers outside the longitudinal bulkheads. The bunkers will have fuel oil capacity which is estimated to be a 30-day supply.

The weight of the dredge, including a normal supply of fuel, will approximate 2300 tons. In average good material it is figured the machine will handle 30,000 cubic yards in a 24-hour day.

The matter of comfortable quarters for those aboard has been well taken care of. Besides the usual features in the living quarters many new ones are to be added, such as the galley being equipped for electric cooking equipment, a refrigerator plant, and a well equipped laundry. A social hall is provided as well as spacious messrooms.

Shops on the main deck for machine work, blacksmithing and carpentering will have power tools operated by separate electric motors.

COMPARATIVE TOWBOAT TESTS

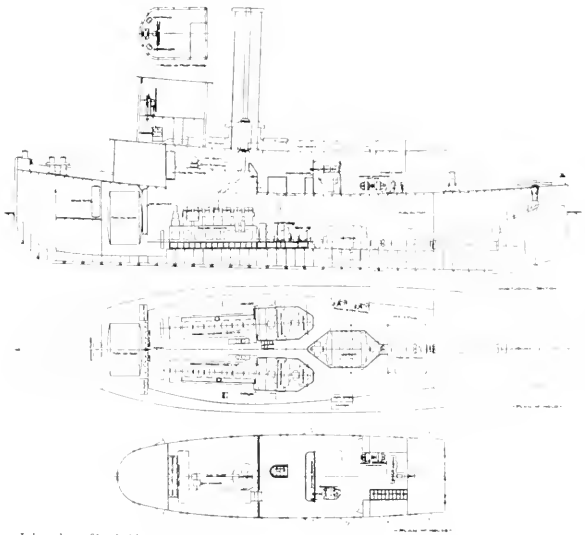
An Interesting Analysis of the Comparative Abilities of Three Tugs in New York Harbor

At the Thirty-second General Meeting of the Society of Naval Architects and Marine Engineers, held in New York November 13 and 14, 1924, Frank L. Du Bosque, vice-president of the society, read a paper describing comparative tests of a steam, a diesel, and a diesel-electric driven tug, each boat being of similar dimensions and almost identical shaft horsepower. The tables and drawings herewith show the characteristics of the three tugs, the principal results of the test and the arrangement and appearance of the diesel-electric tug. Mr. Du Bosque sums up the results as follows (Jumbo, being the first diesel tug, P. R. R. No. 10 the standard steam tug, and P. R. R. No. 16 the diesel-electric tug):

"That the diesel-electric tug has similar power to the steam-driven tug. The advantages accruing with an improvement in the design of the propeller, the present wheel producing a greater speed and greater towline stress with a smaller amount of power.

That the fast turning, relatively small diameter wheel required with the straight diesel drive is not as efficient as the larger diameter wheel driven at a more appropriate speed.

The trials show that the maximum speed, 12.28 miles, obtained by the Jumbo running free could be obtained by the P. R. R. No. 16 with 76 less horsepower on the propeller shaft, and that the maximum towline stress obtained by the Jumbo, 13,160 pounds, could be obtained by P. R. R. No. 16 with 134 less horsepower. This is interesting, showing, as it does, that the straight diesel drive requires 15 per cent more power on its propeller shaft on a tug running free and 26 per cent more power when towing than the diesel-electric, due, it would appear, to the characteristics necessary in the design of the wheel. The losses due to the use of generators and a motor between the diesel engine and the propeller shaft at maximum power are 16 per cent, equivalent to 18 per cent increase in power on the basis compared above. This suggests that there is a large field for experiment in the design of propeller wheels for tugboats equipped with the straight diesel drive. Very little has been done in



Inboard profile, hold plan and deck house plan of the diesel-electric tug P. R. R. No. 16.

this direction, and designers have very little, if any, data from which to reach conclusions, for they must work far below what experimenters consider efficient minimum pitch ratios, and ignore much that has been said as to the advantage of large blade areas for tugboats in order to produce wheels of large enough diameter for tugboat work.

While maneuvering, time can be saved and some collisions avoided if a tug can accelerate and also retard her speed quickly. To determine this feature trials were made with the three tugs, towing and running free. The tow was a carfloat loaded with ten cars of coal, the displacement being 1260 tons. The tugs towed alongside as they always do, and the speed counter was fitted on the bow of the carfloat; observations were made every five seconds.

With the tow the Jumbo reached a maximum speed of 7.08 miles in two minutes and thirty-five seconds. P. R. R. No. 10 reached a maximum speed of 7.3 miles in two minutes and thirty-three seconds, and P. R. R. No. 16 a maximum speed of 7.8 miles in two minutes and thirty-seven seconds. P. R. R. No. 10 reached the Jumbo speed in two minutes and twenty-four seconds, and P. R. R. No. 16 in two minutes and ten seconds.

It will further be observed that on the steam tug, when towing, the stress on the tow-line absorbed 40 per cent of the power delivered to the screw, on the diesel-electric 41 per cent, and on the straight diesel 32 per cent. These figures do not represent the efficiency of the tugboat wheels, as the resistance of the tugboat should be included in the work done by the wheel, but as all of these are tugs of approximately the same displacement, the figures are comparable.

It will be noted that the steam tug and the diesel-electric tugs are of similar power. The weight of the devices required to produce this power is shown in table herewith.

In connection with relative economy of the three types of tugboats, we have no data bearing on the original cost and the operating cost of the straight diesel tug. The original cost of a diesel-electric tug like P. R. R. No. 16 is about 20 per cent higher than a steam-driven tug similar to P. R. R. No. 10. The diesel-electric is operated with one man less in the crew and the fuel costs are less: Tug P. R. R. No. 16 uses 214 gallons of oil in eight hours, which at 5 cents per gallon costs $10.70. Lubrication of a diesel engine is extravagant and swells the above cost to $12.96. The steam-driven tug, P. R. R. No. 10, used 3.58 tons of bituminous coal in eight hours, which at $6.50 per ton costs $23.27. The cost for lubrication is 18 cents or a total of $23.45.

Experience with the diesel-electric tug in service shows several operating advantages, some of which were anticipated. The advantage of pilot-house control and maneuvering at any speed has been described.

Complete comparison of operating advantages of diesel-electric propulsion will be found on the next page of this issue.

MAXIMUM SPEED TOWING

Name	Rev. of screw per minute	Stress on tow line, pounds	Speed, statute miles per hour	I.H.P. total	H.P. output generators	Estimated shaft H.P.
Jumbo	201	13,160	5.95	823		642
P.R.R. No. 10	101.4	15,100	6.34	894		624
P.R.R. No. 16	117	15,180	6.36	1,163	684	625
*P.R.R. No. 16	102	14,450	6.22	1,208	742	683

*When fitted with original wheel.

MAXIMUM SPEED TOWING FREE

Name	Rev. of screw per minute	Speed, statute miles per hour	I.H.P. total	H.P. output generators	Estimated shaft H.P.
Jumbo	202	12.92	643		502
P.R.R. No. 10	114	13.60	715		643
P.R.R. No. 16	133	13.52	1,175	702	646
*P.R.R. No. 16	115	12.82	1,207	745	668

*When fitted with original wheel.

	Jumbo	P. R. R. No. 10	P. R. R. No. 16
Material	Wood	Steel	Steel
Length	101' 0"	165' 6"	1[illegible]
Beam	25' 0"	24' 0"	24' [illegible]
Draught	12' 0"	12' 5"	12' [illegible]
Displacement	550 tons	1,237 tons	1,237 tons
Engines	One six-cylinder Diesel—N. L. S. & Eng. Bldg. Co.	Compound condensing P. R. R. standard	Two six-cylinder Diesel Winton Engine Co.
Dia. cylinders	19½"	18" and 30"	1[illegible]
Stroke	24"	26"	1[illegible]
Propeller,			
Diameter	7' 6"	9' 0"	9' 6"
Pitch	9' 9"	12' 3"	9' 3"
Material	Bronze	Cast steel	Cast iron

Principal characteristics of the three tugs tested

Tug P. R. R. No. 10 (steam)	Tons	Tug P. R. R. No. 16 (Diesel-electric)	Tons
Weight of main engines, pumps, condenser, shafting and propeller	[illegible]	Weight of main engines and attached auxiliaries, air bottles, muffler, shafting and propeller and stack	[illegible]
Weight of boiler, superstructure, stack, pumps, piping and valves	72	Weight of electric generators, main switchboard and wiring	[illegible]
Weight of coal and water, including bunkers and tanks, only necessary	[illegible]	Weight of fuel and lubricating oil and tanks (1.7 days supply)	[illegible]
		Increased weight of tugboat	[illegible]
Total	177	Total	[illegible]

Note—Substituting a B. & W. water-tube boiler for Scotch type reduces weight 50 tons.

Table showing comparative weights of diesel-electric and steam installations.

ADVANTAGES OF DIESEL-ELECTRIC DRIVE

Actual Operating Experience of Pacific Coast Tankers

DIESEL-ELECTRIC DRIVE	DIRECT-DIESEL DRIVE
1: Small high-speed engines arranged in several units with light reciprocating parts, whereby possible breakdown of one unit would only slightly reduce the speed wthout crippling the ship. Constant torque on propeller, eliminating all panting and hull vibration.	1: Large, slow-speed engines, particularly in single screw installations, with only one main engine. A possible breakdown would temporarily cripple the ship. The heavy reciprocating parts of these engines invariably produce panting and heavy vibrations in the hull, especially in large vessels.
2: Propeller speed may be reduced and maintained as low as 1 per cent of rated revolutions, keeping the vessel under a very low and steady headway, maintaining a perfect control by the navigating officers.	2: Engines cannot safely be reduced to more than about 30 per cent of rated revolutions, and if slow speed is required it is necessary repeatedly to stop and start the engines, which impairs the vessel's response to rudder action.
3: No reversing features included in the engines, simplifying construction and eliminating severe temperature and mechanical strains.	3: Reversible type of engines used. Frequent starting and reversing imposes severe temperature strains caused by injecting cold starting air into hot cylinders. Maneuvering also imposes severe mechanical strains in engines.
4: Engines operated at full speed at all times, insuring best effect of piston cooling arrangement.	4: Slowing down of engines for long periods, as in passing through canals or in foggy weather at sea, greatly impairs the piston cooling arrangement and sometimes causes damage.
5: Engines are in continuous operation at constant speed, insuring continuous maximum efficiency of the engines for the load carried. Maneuvering accomplished with propulsion motor only, thus eliminating the necessity of an auxiliary air compressor plant and storage tanks.	5: Maneuvering accomplished with the engines direct, thus requiring a large auxiliary air compressor plant and air storage tanks for starting and maneuvering purposes.
6: A lower first cost and lighter machinery installation due to the elimination of auxiliary plant, as power for both cargo handling and propulsion is supplied by the same engines. Fewer auxiliaries to attend to, simplifying operation and reducing maintenance and repair costs.	6: A greater first cost and heavier machinery installation, due to the large auxiliary plant required for cargo handling and other purposes. More independent machinery to keep in operation and look after, increasing maintenance and repair costs.
7: Engines and propeller being separate, each are operated at their respective speeds of highest efficiency, which is a high speed engine and a slow speed propeller. Electrical generating and transmission losses amount to approximately 12 to 15 per cent.	7: Engines being coupled to the propellers, the engine speed and propeller speeds must be compromised to obtain the best overall results. This causes an efficiency loss of from 6 to 10 per cent.
8: Distribution of weights in conjunction with trim of vessel is easily effected, as the diesel engines may be placed very conveniently on account of not having to be lined up with the propeller shafts.	8: The weights here cannot be shifted to any degree and engine placement is necessarily held within a straight line of the propeller shafting.
9: As the engines are in continuous operation under constant speed in the same direction, all auxiliary water and oil pumps required can be driven directly from the engines themselves, thus reducing the number of independent units to the following: 1 fire and bilge pump. 1 sanitary pump. 1 bilge pump. 1 fresh water pump. 1 transfer pump. 1 small emergency generating set. Total number of units six, of which one must be running continuously while the ship is in operation. This reduction in auxiliary machinery will reduce the annual repair cost.	9: As the engines are subject to stoppage and reversal during maneuvering, water and oil pumps required as engine auxiliaries cannot be attached to the engines and must be operated independently as motor-driven units, which in turn must be installed in duplicates. Including the auxiliary generating sets required for auxiliary power, the independent units required are as follows: 3 auxiliary diesel generating sets. 4 circulating pumps. 2 lubricating oil pumps. 2 air compressors. 1 transfer pump. 1 fire and bilge pump. 1 sanitary pump. 1 bilge pump. 1 fresh water pump. 1 small emergency generating set. Total number of units 17, of which 5 must be running continuously while ship is in operation.

10: Pilot house control is conveniently adopted, bringing all maneuvering operations directly under the captain's control, thus facilitating maneuvering and insuring safety. Starting and reversing under this arrangement can be obtained in a much shorter time than is otherwise possible. Full speed reversals have been obtained in 5 seconds.

11: On account of the electric governing feature of the main propulsion motor, the wheel does not race in seaways. The propeller can come completely out of the water with very little increase in speed. It also has no effect on the main engines.

12: On account of the greater simplicity of the engines, as they are one-way, constant speed, with no maneuvering, the engineers for this type of vessel do not require to be so highly trained in handling and maneuvering the engines.

10: Adaptable only for engine room control, where a mistake in maneuvering is possible and the necessary time element in carryng out the signals is unavoidable.

11: In a seaway with the propellers coming out of the water, on account of the poor governing qualities of both the steam and diesel engine, the propeller has a great tendency to race, thereby considerably racking the vessel and causing vibrations to be set up within the hull structure, throwing greater strains on the propeller blades.

12: Engineers for operating the reversible engine required for direct drive are especially trained in maneuvering diesel engines, as air conservation is of prime importance, being used as a starting medium.

MARINE ELECTRICAL CODE

THE Marine Committee of the American Institute of Electrical Engineers consists of L. C. Brooks of the Bethlehem Shipbuilding Corporation as chairman; J. S. Jones, vice-president, of Chas. Cory & Son, Inc., as secretary; and the following:

R. A. Beekman	J. S. Jones
J. F. Clinton	M. A. Libbey
M. W. Day	W. F. Meschenmoser
C. S. Gillette	I. H. Osborne
H. F. Harvey, Jr.	A. Parker
W. Hetherington, Jr.	G. A. Pierce
H. L. Hibbard	H. M. Southgate
W. F. James	W. E. Thau

A. E. Waller

Subcommittees were appointed to carry on the year's work as follows:

Subcommittee	Chairman	Members
A. E. S. C.	H. L. Hibbard	
History	H. L. Hibbard	Hetherington, Pierce, Day
Radio	A. E. Waller	Beekman, Jones
Operating Personnel	A. E. Waller	Pierce, Day, Southgate
Interior Communication	G. A. Pierce	Clinton, Osborne, Parker
Standard Appliances	W. F. Meschenmoser	Clinton, Jones, Gillette
Auxiliary Machinery	W. E. Thau	Osborne, Harvey, Parker
Propulsion	M. W. Day	Southgate, Harvey, Libbey, That
Editing	R. A. Beekman	Hetherington, Harvey
Wire and Cable	C. S. Gillette	Meschenmoser, James
Publicity	H. M. Southgate	Beekman, Libbey, Jones
Marine Standards	J. F. Clinton	

The Marine Committee of the American Institute of Electrical Engineers has performed a very valuable service to the Navy and Merchant Marine in the compilation of "Recommended Practice for Electrical Installations on Shipboard, Marine Rules." An effort is being made by the committee to keep this set of rules up-to-date at all times, and they have been received with interest by engineers and operating personnel throughout the shipyards and merchant marine of this country.

The committee, composed of the representative and leading marine electrical engineers and manufacturers in the country, is treating with marine electrical problems from main propulsion to signaling and communication subjects, as well as lighting and power.

The Navy Department has also at all times been represented by one of its foremost technical officers, and it is believed that the work of this committee meets with the full sympathy and support of the marine electrical industry at large.

WINTERTHUR, SWITZERLAND

GERMAN American Petroleum Company (Standard Oil Company), Hamburg, has ordered two tankers of 12,000 tons from our licensees, the Howaldtswerke, Kiel, Germany. Each ship will be fitted with the following Sulzer 2-cycle engines:

2 main engines of 1350 B.H.P. at 100 R.P.M.
2 aux. engines of 330 B.H.P. at 210 R.P.M.
1 aux. engine of 80 B.H.P. at 400 R.P.M.
1 compressor of 140 B.H.P. at 400 R.P.M.

All these engines will be built at the Sulzer works in Winterthur. It is interesting to note that the above oil company owns already one Sulzer-engined tanker, the Phoebus, and has ordered lately another tank ship at the Chantiers de la Giroude, Bordeaux, France, to be fitted with a Sulzer 2-cycle engine of 1850 brake horsepower.

REQUEST FOR OLD VOLUMES
Volumes I-VIII; Pacific Marine Review

The New York Public Library is desirous of procuring Volumes 1 to 8, inclusive, of Pacific Marine Review in order to complete the file of this magazine. This is the most used library in the world and if some old subscriber of Pacific Marine Review has the desired volumes and would not be willing to present them to the library, the library is willing to pay a reasonable amount to secure what it lacks.

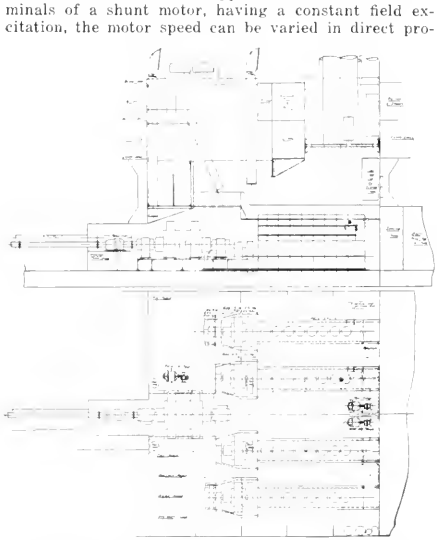
COMPARISON OF DIESEL-ELECTRIC AND DIRECT DIESEL PROPELLING EQUIPMENTS

By W. E. THAU and H. C. COLEMAN
Marine Engineers, Westinghouse Electric & Manufacturing Company

WITH the economic necessity of the use of the diesel engine for merchant ship propulsion established, because of foreign competition, it is highly desirable to give careful consideration to the question of the most advantageous and satisfactory way of applying this type of engine. Exhaustive studies have been made of the problem, with particular reference to the conversion of present Shipping Board steam vessels to motorships, and it is the purpose of this article to bring to the attention of the shipowners and operators and other interested parties, the results of this work and the conclusions reached.

Detailed comparisons were made of the two general methods of applying diesels, i. e., using large slow speed engines direct connected to propeller shafts and using a number of smaller higher speed engines direct connected to direct current generators supplying power to a double unit motor connected to the propeller shaft. In the diesel-electric system the data have been prepared on the basis of using the voltage control or Ward Leonard control scheme. With this system, shunt machines are used and both motors and generators are separately excited, preferably from the same source. The motor fields are excited at constant potential and always in the same direction. The excitation of the generator fields is varied to suit the motor speed and direction of rotation desired.

By varying the voltage applied to the armature terminals of a shunt motor, having a constant field excitation, the motor speed can be varied in direct proportion, both as regards speed value and speed direction; and since the voltage generated by a constant speed, separately excited, shunt wound generator is directly proportional to its field excitation (neglecting saturation), the motor speed is, in turn, proportional to the generator excitation. With such an arrangement, therefore, it is only required to vary the generator fields from full excitation in one direction to full excitation in the opposite direction, to cause the motor to maneuver from full speed ahead to full speed astern. To further simplify this method of control, all machines are connected in series. With the series connection, it is unnecessary to maintain like speeds on all the engines. Provided the generators are excited equal amounts and have identical performance, the only effect of difference in engine speeds is a proportional difference in the loads carried by the generators and their driving engines. From an operating standpoint, therefore, the series arrangement is ideal and permits of by far the simplest system.



Arrangement of engine room of Shipping Board 9400 deadweight ton vessel for diesel-electric drive with four 850 brake horsepower, 250 revolutions per minute diesel engine generator sets, and a 2800 shaft horsepower 90 revolutions per minute propelling motor.

Since it is only necessary to handle the generator field excitation currents for maneuvering the ship from full speed ahead to full speed astern, or holding any particular desired speed, the economy of the Ward Leonard system is obvious for the reason that the generator field excitation power does not exceed 1½ per cent of the total output of the generator. Dealing with these small currents, the control is extremely simple and inexpensive. This simplicity has a further direct effect on the maintenance of the equipment.

In comparing the two types of drives, the requirements may be enumerated as follows: reliability, weight, space, installation, first costs, fuel consumption, and operating costs.

Reliability: Reliability should be the first consideration in selecting any propulsive equipment. Compared with single screw direct diesel drive, the diesel-electric drive has the following distinct advantages:

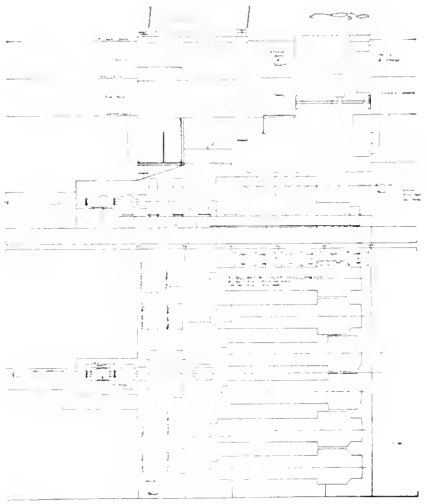
(a) A number of units provides reserve power in case of casualty to an engine. For example, in a four-engine installation the following ship speeds may be mantained, based on the power varying as the cube of the speed:

Four engines—100 per cent ship speed.
Three engines—91 per cent ship speed.
Two engines—79 per cent ship speed.
One engine—64 per cent ship speed.

The electrical system is such that full power may be obtained from each engine in operation.

(b) The smaller cylinders and absence of oil-cooled pistons and reversing gear is decidedly conducive to lower maintenance by virtue of the simplification of the engine and plant.

(c) Smaller and lighter parts greatly facilitate repairs. This feature, together with the flexibility resulting from the use of a number of engines, makes repairs at sea and routine inspection and overhaul possible while the vessel is under way. Also, the facility of correcting minor defects as soon as they develop, wth comparatively negligible loss in ship speed, will reduce maintenance to a minimum and



Arrangement of engine room for a 9400 deadweight ton Shipping Board vessel with six 525 brake horsepower, 270 revolutions per minute diesel engine generating sets, and a 2650 shaft horspower 90 revolutions per minute propelling motor.

approach 100 per cent plant operation. This also adds to the contented temperament of the engine room personnel.

(e) Perfect and instant control from the bridge eliminates all possibility of mistaken signals and thus safeguards the ship in restricted waters.

(f) The compressed air problem is reduced to its simplest terms since the engines operate at constant speed and in one direction at all times regardless of propeller maneuvers.

(g) The addition of electrical apparatus introduces no hazard for the reason that its thorough reliability is established beyond a doubt. The electrical system employed, as previously pointed out, is the simplest possible and easily understood. The motors and generators are simple and require very little attention.

Weight: The difference in weight varies with the engines selected in both cases. An analysis of total machinery weights, including deck and engine room machinery, foundations, ladders, gratings, structural work, etc., based on three types of direct-connected engines and three types of diesel-electric drive engines suitable for delivering 2650 to 2800 shaft horsepower, discloses an average weight difference of 116 long tons in favor of the diesel-electric. In this analysis the direct-connected engine speeds covered a range of 85 to 105 r. p. m., while the motors of the electric drive are designed for 90 r. p. m. Some of the direct-connected engines which will undoubtedly be used in the conversion work are heavier than the average direct-connected engine used in this analysis.)

To evaluate the weight saving in the case of the diesel-electric drive, it is fair to consider that one-half the difference would be used for additional cargo. This factor of one-half allows for the possibility of not being able to obtain the additional cargo on some trips and of carrying cargo on which a lower rate of freight is paid, on other trips. Assuming that the vessel travels 42,000 miles per year and that the freight rate is $5 per 1000 ton miles, the additional yearly earning capacity of the diesel-electric ship over the direct-connected diesel vessel is

$$\frac{116}{2} \times \frac{42{,}000}{1{,}000} \times \$5 = \$12{,}200$$

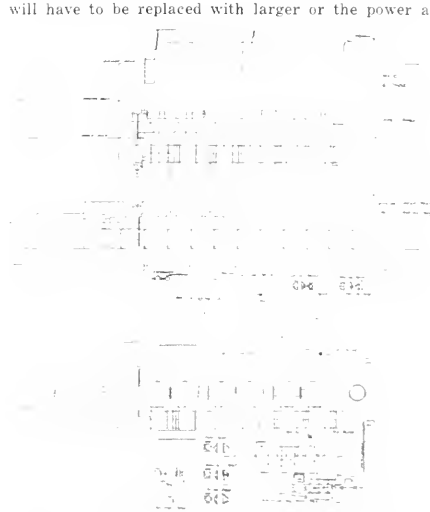
Conversely, if it is desired to consider a given cargo in both cases, slightly less power would be required for a given ship speed, in the case of the diesel-electric vessel.

The advantage of being able to handle 116 tons additional peak cargo at certain times will be obvious to owners and operators.

Space: In comparing space requirements, the differences are found to vary considerably with the engines used. Owing to the lesser head room required in the case of the diesel-electric drive certain overhead space is available for cargo without changing the present arrangement of flats.

Installation: The average total installation costs, including placing and aligning of machinery, wiring, piping, foundations, and structural changes, are in favor of the diesel-electric by approximately 15 per cent.

The diesel-electric drive allows of better distribution of weight as the engines are entirely independent from the propeller shaft and may be located so as to best suit the space and weight distribution requirements with minimum changes to the present structures. Also, another important advantage of the diesel-electric drive is the fact that no propeller shaft changes are required at present propeller speeds and 2800 shaft horsepower, because of the constant torque exerted by the motor; or, conversely, no reduction in power over the present power at present revolutions per minute is necessary with the diesel-electric. However, with the direct-connected diesel, due to its varying or pulsating torque, either the present shafting will have to be replaced with larger or the power at



Arrangement of engine room for 9400 deadweight ton Shipping Board vessel with a 2800 brake horsepower diesel engine, direct-connected to the propeller shaft.

present revolutions per minute must be reduced or the speed at 2800 shaft horsepower increased over the present value in order to come within the rules of the American Bureau of Shipping. Should the power or speed be changed it is quite likely that new propellers would have to be fitted, resulting in additional costs.

First Costs: An analysis of the total costs of conversion, including total machinery installation (deck and engine room), foundations, etc., based on the average of acceptable direct-connected engines as compared with perfectly suitable and reliable diesel-electric drive, shows that the latter costs no more, and in some cases less, than the direct drive, in instances where the present shafting does not have to be changed. Where shafts must be replaced because of direct drive, there is an additional cost for the direct drive of $30,000 or more. Where speeds are increased so as to bring the shaft requirements within the limits of the rules of the American Bureau of Shipping at 2800 shaft horsepower, with direct diesel drive, new propellers at a cost of $8000 to $10,000 are required. While it is recognized that double-acting two-cycle engines will require shafting only slightly in excess of that for the constant torque electric drive, it is nevertheless true that this type of engine cannot be considered as an established development at the present writing. Furthermore, any advantages incident to this engine as a direct drive appliance will apply in like proportion to electric drive engines. The foregoing relates to average conditions. For local business reasons, isolated examples may be at variance to this analysis. However, such cases cannot be considered as representative of general market conditions.

Fuel Consumption: (a) At sea: In regard to fuel consumption it is admitted that the fuel cost will be less for the direct drive than for the diesel-electric. However, a consideration of the actual amount of this difference will show that this is a greatly over-stated difference. Assuming that a ship travels 42,000 miles a year, the difference in fuel cost would be as follows:

0.39 pound oil per s. h. p. hour for direct-connected engine.

0.485 pound oil per s. h. p. hour for diesel-electric drive.

Because of the difference in propeller and operating efficiency due to:

(a) Constant torque of the diesel-electric as compared with the cyclic variation in torque of the direct drive;

(b) Average difference in propeller speed;

(c) Percentage of operation at reduced power (diesel electric can be operated at full load unit fuel rate at reduced speed, whereas the economy of the direct drive decreases with reduced power),

the diesel-electric would not consume in excess of 20 per cent more fuel than the direct drive. (4.5 per cent allowed for (a), (b) and (c).) Therefore, the net difference per shaft horsepower hour (at sea) is 20 per cent; or the diesel-electric requires 20 per cent or 0.078 pound per shaft horsepower hour additional fuel over that used by the direct drive. Then, assuming a ship speed of 12 miles per hour at full power, additional fuel consumed per year by the diesel-electris is

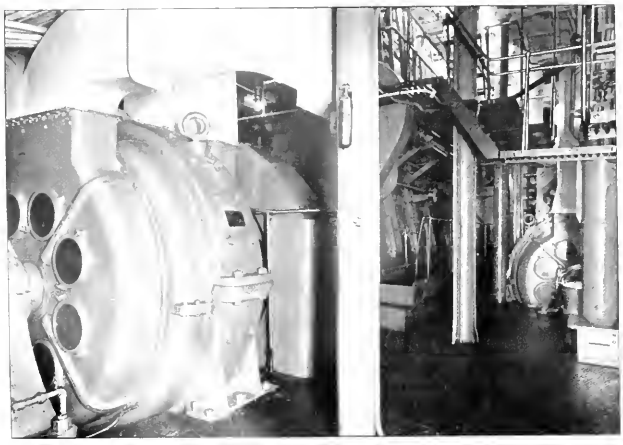
$$\frac{42{,}000}{12} \cdot 0.078 \times 2800 = 765{,}000 \text{ pounds}$$

Using 340 pounds of oil per barrel and assuming the cost of fuel oil as $2 per barrel, the additional fuel cost (at sea) per year for the diesel-electric is

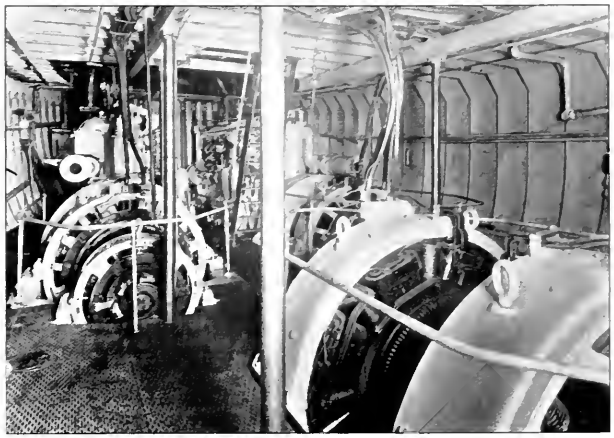
$$\frac{765{,}000}{340} \times \$2 = \$4500$$

which is in favor of direct drive.

(b) **In Port:** It is proposed to use one 50 kilowatt auxiliary diesel generator set, which will be used when not handling cargo. One of the main engines will be used in port when handling cargo. For the direct drive, three 100 kilowatt auxiliary generating sets are required to take the port load. The average port load will be about 300 engine b. h. p. when handling cargo and 40 b. h. p. when not. Comparing the engine unit fuel consumption, the large engine at 300 b. h. p. load will require about 0.55 pound per b. h. p. hour, while the smaller engine (150 b. h. p.—two or three in use simultaneously with direct drive) will consume about 0.48 pound per b. h. p. hour, making a net difference of 0.07 pound per b. h. p. hour.



An excellent example of the adaptability of the diesel-electric plant to marine uses is found in its application on hydraulic dredges. The illustration herewith is a view in the engine room of one of the U. S. Army dredges recently completed. It shows one of the McIntosh & Seymour-Westinghouse diesel-electric generators, of which there are four on each dredge, supplying power for the dredge pumps, a propelling motor, and all of the auxiliary machinery.



View in the engine room of the diesel-electric tug P. R. R. No. 16. Complete characteristics of this tug and the story of its successful trials in competition with steam and direct diesel driven tugs, as well as of the advantages inherent in this method of drive as proved by these tests will be found in an article beginning on page 628 of this issue of Pacific Marine Review.

Assuming 2500 hours per year cargo load, we have:

$2500 \times 0.07 \times 300 = 52{,}500$ pounds fuel oil additional per year for the large engine, which gives:

$$\frac{52{,}500}{340} \times \$2 = \$309$$

additional fuel cost per year for port consumption for the diesel-electric, which favors the direct drive.

To offset the above, we have the lower rate of fuel for auxiliaries while at sea in that they are supplied from exciters driven by the main engines at a fuel rate of 0.42 pound per engine b. h. p. hour, whereas with the direct drive the fuel rate of the 150 b. h. p. auxiliary engine at 45 b. h. p. will be about 0.53 pound per b. h. p. hour. This gives 0.11 lb. per b. h. p. hour additional fuel required by the direct drive. Assuming 30 kilowatt load (45 b. h. p.) at 3500 hours sea time, we have

$$\frac{45 \cdot 0.11 \cdot 3500}{340} \times \$2 = \$102$$

per year additional for the direct drive, favoring the diesel-electric.

Operating Costs: The study indicates that the personnel should be the same for both the direct diesel and diesel-electric drives, particularly because single screw ships are being considered.

Summarizing the other yearly operating costs, we have:

Favoring diesel electric—
- $12,200 additional cargo revenue.
- 102 auxiliary fuel saving at sea.

$12,302 total.

Favoring direct diesel—
- $4500 fuel saving at sea.
- 309 fuel saving in port.

$4809 total.

The difference equals $7493, favoring diesel-electric. The equivalent capitalization at 15 per cent would be $50,000, which represents the additional amount that could be paid for diesel-electric equipment to place it on the same basis with the direct diesel drive. However, the cost analysis shows that this amount would be an excessive difference when compared with the actual figures. All cost figures in this study are on the same basis and therefore the relative comparison is correct.

The above analysis is based on the ship having the same capacity of fuel oil tanks for either type of drive. Since the diesel-electric drive requires approximately 20 per cent more fuel oil than the direct diesel, the ship fitted with the former would have about 20 per cent shorter radius of action for each fueling. However, if it is desired to compare the two drives on the basis of equal radius of action, the additional weight of fuel oil carried by the diesel-electric ship must be taken into account. The total additional fuel oil per year for the electric drive, including that for port as well as at sea, is $765{,}000 - 52{,}500 - 17{,}300 = 800{,}200$ pounds or 358 long tons.

Based on ten voyages per year and on fueling per voyage, the diesel-electric ship must carry 35.8 long tons more fuel oil per voyage than the direct diesel ship. Subtracting this from the machinery weight saving, the revised additional yearly cargo revenue becomes $8430 and the difference in yearly operation costs favoring the diesel-electric is $3723, which gives an equivalent capitalization of $24,800.

Auxiliaries: It is, of course, expected that all the vessels converted to motorships will be equipped with an all-electrical auxiliary system. The waste incident to donkey boilers and steam auxiliaries has been recognized practically since the advent of the motorship, and the use of electrical auxiliaries is considered almost as much an economic necessity as the diesel engine for propulsion. The performance of electrical auxiliaries on motorships for the past ten or twelve years has proved and thoroughly established their reliability for the service.

Conservatively speaking, deck auxiliaries require less than one-tenth as much fuel as steam machinery.

A very exhaustive analysis of the advantages of electric drive for deck auxiliaries will be found in the article on page 638 of this issue of Pacific Marine Review, entitled "Electric Cargo Winch for Shipboard Service," by A. O. Loomis.

PACIFIC WORKBOATS AND THEIR POWER PLANTS

AT LOS ANGELES HARBOR

SAN PEDRO, now absorbed by and a part of Los Angeles, has for many years been of considerable importance as a shipping port. Its fleet of fishing and other small craft is numerically greater than any other port on the Pacific Coast. This has been brought about by two factors: first, fishing; second, the making of a fine harbor which is sheltered at all times. This harbor is most favorably thought of by naval folks and yachtsmen, and there is hardly a time that several navy and pleasure vessels are not anchored there.

The above conditions have thus tended to develop a fine type of workboat, and several firms are engaged in building and outfitting this class of craft. The principal yards are those of Garbutt & Walsh, who have 14 ways for hauling out and building; the Harbor Boat Works, with 2 ways and 3 transfer cradles; L. Larson (formerly with Kneass of San Francisco), with 4 ways; the Wilmington Boat Works; and the Fellows & Stewart establishment at Wilmington, and while not in San Pedro proper might all be entered in the district, as all are within Los Angeles city limits.

The customs records show that there are 2051 workboats registered at Los Angeles, and 185 at San Diego, also a few at Santa Monica. The 27th District takes in the lower coast from Santa Monica south. From F. D. W. Putnam, deputy collector in charge, a Pacific Marine

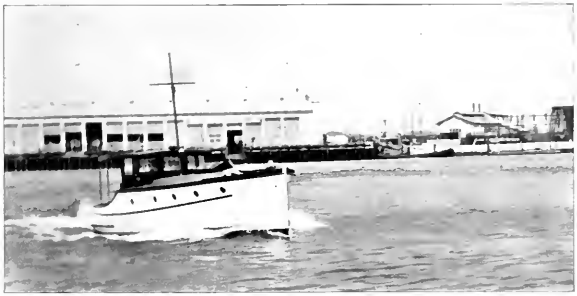
James N. Shuck, chief engineer of Fellows & Stewart of Los Angeles harbor. Mr. Shuck is here shown demonstrating the patented tiller with which all of the boats made by Fellows & Stewart are equipped.

Review representative gathered much valuable information regarding shipping. While perhaps not exactly workboat material, it may be noted that for the month of July, 1924, the export trade of the harbor totaled $7,001,116. Some 275 vessels, aggregating three-fourths of a million tons, with a total crew list of about 12,000 men, handled the cargoes to make up the valuation given, which will, in a very brief way, show the volume of business carried on by water. This business, to a great extent, means earnings for workboats.

Of the several yards visited, all seemed fairly busy. Quite a number of new jobs are on the ways and prospects for others are good. Taken as a representative yard, that of Fellows & Stewart might be an interesting one to mention. This establishment specializes in "taxiboats" and has perfected a type particularly adapted to the service of handling traffic to and from the naval and other vessels in the outer harbor. The first of this type were from 30 to 35 feet long and lightly built. They were in no way standardized and needed constant repairs and attention. There were, a few years ago, about twenty of these. Now there are over two hundred.

One of the latest, the Marcella II, is 47 feet long by 9 feet 6 inches beam. Her keel is 3 inches by 14 inches O. P., clamps 2 inches by 8 inches double. The engine timbers are very heavy, she is flush decked forward, with a sturdy pipe frame for the canvas shelter aft. This is so designed that it is always clear when alongside vessels or wharves. Fuel tanks hold 600 gallons. The power plant consists of an 8-cylinder Sterling engine of 200 horsepower, which gives her a speed of 18 to 20 miles with 75 passengers on board. She is of the one-man control type, and the plant is operated exactly as an automobile. A special feature is the stern construction. This is so arranged that the bearing can be taken out, with the bronze propeller shaft in place, and the bearing rebabbitted on a steel mandrell in the shop. Advantage of this is obvious where a bronze shaft is used. In fact, complete spare bearings can be kept in stock to be put on at any time. The skin bearing is of lignum vitae, bored in place true with the gland and engine shaft center, making a very fine mechanical job. The rudder is of $\frac{3}{8}$-inch

Los Angeles harbor water taxi on the ways at Fellows & Stewart.



Santa Monica speed workboat.

boats at Santa Monica during the summer season, used in passenger traffic. They are specially high powered so as to give a thrill to the riders. They are 33 feet in length, 8 feet beam, and have 235 horsepower Sterling engines. They carry 15 passengers and make 30 miles an hour, at times jumping almost clear of the water at highest speed. They were built by Fellows & Stewart of San Pedro, and in spite of lightness are very strong. One of them was thrown by a sea against an 8-inch pile at the wharf in rough weather lately breaking the pile but leaving the workboat unhurt except for a bit of paint scratched.

Tobin bronze plate, with manganese bronze stock. Another refinement is the installation of a heavy copper exhaust pipe, jacketed five feet aft of the engine. The whole boat is strongly and neatly finished and a very marked improvement on the first of the taxiboats. This development has taken several years, but the result is worth the pains taken.

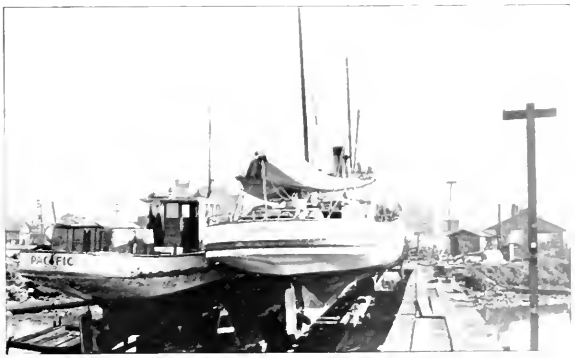
James M. Shuck and J. Fellows are active in the management, and every boat turned out must be perfect in all details. Their establishment has a most complete stock and storeroom, carrying more than the average marine hardware or ship chandlers place. A good machine shop and smithy, in addition to a section devoted to building tenders and dinghys, make it possible for a prospective owner of a craft, either pleasure or business, to get everything complete at one place.

To keep their organization in hand the firm are now, at the beginning of the slack season, starting to build ten 32-foot, five 26-foot, and five 18 foot stock cruisers. This is called winter work, to which may be added about 150 rowboats and skiffs.

An 18-foot family launch. This is another Fellows & Stewart standard type. Powered with a 12 horsepower Universal engine, she makes easily 10 miles an hour when fully loaded.

Santa Monica Speed Workboats.—There are a couple of speedy workboats at Santa Monica during the summer season, used in passenger traffic. They are specially high powered so as to give a thrill to the riders. They are 33 feet in length, 8 feet beam, and have 235 horsepower Sterling engines. They carry 15 passengers and make 30 miles an hour, at times jumping almost clear of the water at highest speed. They were built by Fellows & Stewart of San Pedro, and in spite of lightness are very strong. One of them was thrown by a sea against an 8-inch pile at the wharf in rough weather lately breaking the pile but leaving the workboat unhurt except for a bit of paint scratched.

San Diego Workboats.—Construction and operation of workboats in San Diego harbor has not, as yet reached the magnitude that it has in some of the Northern ports. Still there are a number of them built and engined there. The Marine Construction Company, specializing Star sailers, and the Campbell Machine Company in power craft are the principal firms engaged in the work. The latter have a very well equipped yard and machine shop, turning out fine jobs. They have recently finished three 65-foot fishing boats for use in Mexican waters. Quite a bit of repair work is handled as well, they having a good marine ways for small vessels. Accompanying illustration shows two fishing boats hauled up. The Harbor Commissioners are to soon put in a sea wall and fill, and the firm then intends to put in a set of very much larger ways, equal to hauling out up to 800 tons or more.



Boats drawn out on the ways of a San Diego [illegible]

AUXILIARIES, SHIP SUPPLIES AND MARINE EQUIPMENT

ELECTRIC CARGO WINCH FOR SHIPBOARD SERVICE

By A. O. LOOMIS, Marine Engineer, Westinghouse Electric & Mfg. Co.

A LARGE portion of the freight handled at the ports of the United States is moved by the ship's winches. Lines which are operated from the winch drums or heads are led through blocks attached to the booms and masts.

Usually the cargo winch is idle more than it is active, due to the fact that the vessel is at sea more than in port. However, when idle at sea, the winch is exposed to rain, snow, and ice; sometimes the waves beat against the equipment. Despite these unfavorable conditions, the winch is needed for immediate service when port is reached. Obviously, such service must be reliable and sometimes continuous during the ship's stay in port.

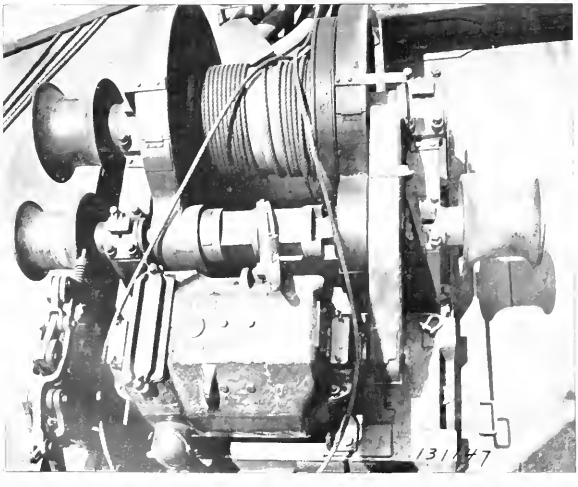
The winch should be rugged with important parts accessible; occupy minimum deck space; have the moving parts protected so that the line cannot foul the equipment; also the gears and machined parts protected from the weather; have provision for adequate lubrication; operate quietly; and have a suitable and efficient form of electric drive.

Filipino stevedores loading sugar.

An illustration shows a compound geared winch manufactured by the American Engineering Company and installed on the motorship William Penn. The rating of the winch is 3-6 tons, for which a compound wound, 30 horsepower motor at 400 r. p. m. is used. The diameter of winch drum is 18 inches, the high and low gear ratios being 12.5 and 26.5 to 1 respectively. The clutch for the operation of the second reduction from the first can be left in neutral, in which case the hoisting drum proper will be inoperative, only the two small gypsy heads turning when the motor is running. A shoe-type, shunt wound brake has its wheel mounted on the motor shaft. This brake is capable of handling overloads on the hook; and since its action is almost instantaneous after the controller handle is brought to the off piston, there is but little use for the foot brake also supplied with this winch.

A typical Singapore stevedore. This photo, and that centered above, were taken on a recent round-the-world cruise of the American motorship Challenger. Stevedores of this type found no difficulty in quickly mastering the control of the electric deck winches.

The ship's electrician has the electric winches always in readiness for instant service. No preliminary warming up of the winches is necessary. The hatches are cleared by rolling back the tarpaulin which covers the hatch boards, removing the boards by hand, setting them aside, and moving, by means of the winches, the the strongbacks or steel beams which support the covering.



View looking [illegible] compound-geared, electric deck winch, as installed on the American motorship William Penn. The motor is 30-horsepower at 400 revolutions per minute. Westinghouse compound-wound. The [illegible] is by the American Engineering Company.

Single Whip Method

For single whip operation in load-

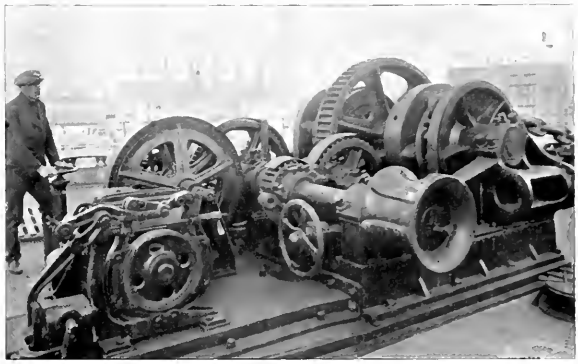
ing the ship, the load is dragged on skids or inclined plankways up to the hatch coaming. Since the boom must be placed over the hatch, there is no means for lifting the draft perpendicularly from the pier.

The gangway man gives the signal to the winchman who operates the controller, and the load is dragged along the skids and out over the hatchway. The load is lowered so that it remains suspended above the deck on which it is to be placed. Some of the hold men swing the load as far as possible in the direction in which it is to be stowed, the winchman being able to land it accurately. The loaded sling is replaced on the hook by an empty one which is raised by the whip, caught by the whip runner, and thrown to the pier. The cycle is repeated.

The single whip method of cargo handling is slow, also there is danger of damaging some of the freight by dragging it over the skids, swinging of booms, etc.

Burtoning

By the use of two booms and two falls, the handling of cargo can be speeded up considerably, also there is no need of dragging the cargo on skids. The central boom has its end block, through which the up and down fall passes over the hatch, and the second boom has its end block, through which the Burton fall passes over the pier. The ends of both falls are fastened to the load, which, when loading the ship, is lifted from the pier on the Burton fall, moved over the deck by means of both falls and finally by the up-and-down fall lowered to the hold or platform under the hatch. Two winches, one for each fall, are needed to care for this so-called Burtoning method of handling cargo.



An electric windlass. In this case the motor is applied to the old steam windlass through suitable gearing.

It is seen that this method is not dependent upon the swinging of booms the motions of which must be carefully gauged. Since nothing moves but the lines and the hook, the action is very positive, for when one line is carrying, the hook is directly in position over the hatch, and when the other line is carrying, the hook is directly over the door in the pier shed.

There are some who consider the Burtoning system a poor method of handling cargo, because the load is lowered to a precise spot. If this depositing point is blocked, the system is put out of action until the place is clear. The quay crane used extensively abroad is free from this disadvantage on account of its radial action. However, this apparent advantage is offset by the necessity of swinging the cargo instead of moving it in direct lines.

The Winch Motor

The winch motors have massive frames and feet, large shafts, and are water-tight. The fields and armature coils are both insulated with high temperature insulation, which enables the motor to be rated on the basis of 75 degrees C. temperature rise. The motors are wound with series or compound windings.

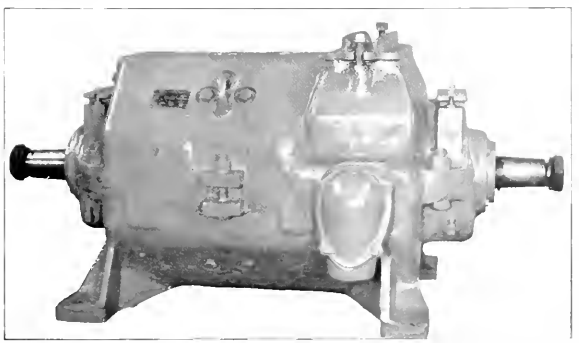
The frames, which are of cast steel, are divided horizontally. The joints are machined and red lead applied at the joint for the purpose of avoiding leaks. The halves of the frames are held together by means of six large bolts.

The large opening at the front of the motor over the commutator is convenient for the inspection and adjustment of the brushes which are supported on two arms attached to the top half of the frame. In addition, these motors have hand-holes closed by covers, and gaskets at each end of the frames. The inspection of the lower interior parts of the motor is accomplished through the hand-holes.

The motors have four main poles and two commutating field poles, all laminated. All poles are bolted from the outside except the lower commutating field pole, which has its bolts entered from the inside to permit the removal of the pole and coil from the motor without removing the lower half of the motor from the bedplate.

The armature coils are form-wound with mica and asbestos insulation and dipped in a special moisture-resisting insulating varnish.

Armature bands over the coil ends are put on under a heating process which softens the insulation and insures the permanent location of coils and bands in service. The core bands rest on both the armature



A 30-horsepower Westinghouse compound-wound D. C. motor as used on cargo winches.

coils and the teeth. No wedges are used in the core.

The brush holders are of the sliding box type. Each brush holder is insulated from the frame by a porcelain bushing and a micarta tube around each supporting rod. The micarta tube is protected by a brass screen.

The bearings consist of split cast iron, babbitt lined shells. They are supported in bearing housings cast integral with the frame, and are clamped between the two halves of the frame. Oil lubrication by means of oil rings is standard for this type of motor.

Shafts which have tapered extensions at both ends are large, and made of axle steel. It is possible to press out the shaft without disturbing the commutator or windings.

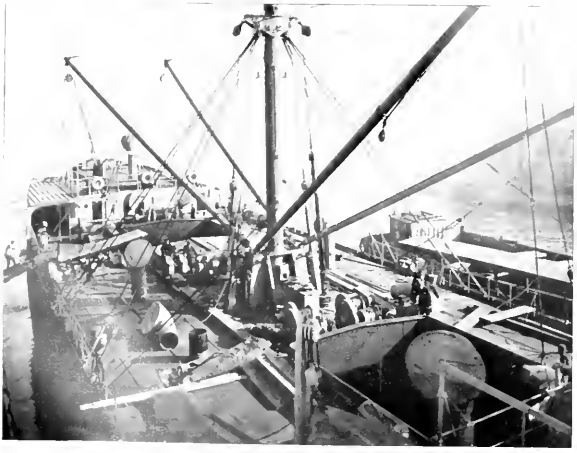
To prevent leakage of water inward, stuffing boxes having graphitized asbestos packing are used where the shaft extends through the outside of the brackets.

Brakes

The brakes used for service on the cargo winch motors are of the shoe type, magnet operated. They are attached by means of two feet to the bedplates on which the motors rest. For winch service (spur gear drive) a brake which will hold the armature shaft from turning under full load torque is recommended.

Shunt brakes are recommended, especially for straight reversing service, because trouble is often experienced with a series brake setting on the light load current used for running the equipment with its friction load only. The action of the shunt coil is sufficiently rapid so that either the release or the setting occurs within a fraction of a second. More rapid action of the shoes is not desirable, especially where dynamic braking in the off position increases the total braking effort. The slight retarded action of the solenoid brake at the beginning of the setting lessens the wear of the shoes. The brake shoes are made of asbestos having a copper wire mesh.

View on the American motorship Seekonk showing method of installing deck winches on platform which has been found ideal in vessels carrying deck loads.



View on the [illegible] Challenger, showing arrangement of winches and [illegible] the deck level.

Manually Operated Cam Controllers

The watertight controller is suited for deck service, especially for winches which are operated usually by a rough class of labor.

The protective panel may be included as a part of the controller in a watertight cabinet, bolted to the side or separately mounted in a non-watertight enclosure, likewise the resistors. The mounting of the protective panel and resistors in a suitable deck house or protected location is preferable to the use of watertight cabinets for these adjuncts. The question of accessibility of these parts of the equipment in locations protected from the elements is of great importance.

These cam controllers are used for starting and adjusting the resistors in series and parallel with the motor armature. The protective panels give overload and low voltage protection. The registers are designed for heavy intermittent (speed regulation) duty, having a time rating equivalent to two minutes on, out of a total of four minutes.

The contactor switches function the same as those of contactor controllers, except that the contactors are operated by cams mounted on the controller shaft. Normal movement of the controller handle causes the contactors to open or close with a quick positive action which reduces arcing. The line contactors which open and close the main line circuit are protected by magnetic blow-outs which aid in extinguishing any arcing that may occur.

Each contactor is closed by a cam operating on a roller on the moving contact element, and opened by a strong compression spring when the cam is moved away from the roller.

The frame is of very rugged cast iron construction, with removable front and side doors. These are hinged and can be closed by bolting to the frame, the flanges being fitted with heavy rubber gaskets insuring water-tightness.

The camshaft is actuated by a vertical handle operating through miter gears in the top of the casing. The shaft for this handle is extended on both ends so that the operator has the choice of two operating positions. A star wheel and pawl are provided in the mechanism to enable the operator to "feel" the notches and make it impossible to leave the controller in intermediate positions.

In order to guard against plugging the equipment by throwing the handle instantaneously from full hoist to full lower, or vice versa, a mechanical time element is introduced by a staggered construction of the guide segment of the handle. The travel of the controller handle in returning from either extreme through the off position is directed against a stop in the off position, which requires a right-angular movement of about one inch before the handle is free to pass through to the opposite position.

Motorship William Penn

Even though approximately 250,000 tons of cargo have been handled, by ten such winches installed on the motorship William Penn, there has been comparatively little spent by the operators for maintenance of the winch equipments during three years' service. This vessel is now in service, making regular trips around the world, calling at the following ports: New York, Savannah, Panama, Honolulu, Yokohama, Kobe, Shanghai, Foochow, Swatow, Hongkong, Manila, Cuba, Surabaya, Singapore, Port Said, Marseilles, London, Rotterdam, and Liverpool, and therefore the winches have been operated by stevedores of many races.

The Motorship Californian

The Californian, a twin screw vessel of 11,000 deadweight tons, operated by the American - Hawaiian Lines, is engaged, with a fleet of other ships, in trade between the Atlantic and Pacific ports of this country; namely, New York, Philadelphia, Boston, Charleston, Los Angeles, San Francisco, Oakland, Seattle, Tacoma, Portland, and Astoria.

This vessel has fourteen of the American Engineering Company's double geared winches similar to those already described for the William Penn, and two Shepard Crane & Hoist Company's winches, operating on the mechanical load brake principle and requiring straight reversing control equipment instead of that giving dynamic braking when lowering. Westinghouse motors, brakes, and controllers are used for the deck machinery on this vessel. Diesel-electric sets supply the electric energy for the power and lighting, with fuel consumption, while tied up at dock, of from three to five barrels of fuel oil a day, depending upon the weight and amount of cargo handled and hatches working at full capacity. Considerably more than 200,000 tons of miscellaneous cargo have been very satisfactorily handled by these winches.

There is one great difference in which the arrangement of the electric equipment for the Californian differs fom that of the William Penn—namely, the housing of the starting, regulating, and brake resistors.

The Californian has carried electrical spares for a little over two years. She has had occasion to use some parts, yet much of the original stock is still on hand, despite the fact that she has about 50 per cent more winches than the ordinary vessel of smaller size, or even the William Penn of her own size.

The Motorship Seekonk

The William Cramp & Sons Ship & Engine Building Company purchased from the Shipping Board the single screw steamship Seekonk, having a deadweight capacity of 7754 tons, and converted this vessel into a motorship having diesel engine propulsion and fitted with diesel-electric sets in the engine room for the auxiliary power. The motorship Seekonk is operated by the United American Lines between Baltimore, New York, Savannah, Canal Zone, Los Angeles, San Francisco, Columbia River, and Puget Sound ports.

The Seekonk's winches, of which ten were constructed by the William Cramp & Sons Ship & Engine Building Company, are compound geared, having a $1\frac{1}{2}$ to 3 ton rating. Westinghouse 20 horsepower, series-wound motors of the type already described are used to drive the winches. The light hook hoisting speed is 470 feet per minute. A 2500 pound draft can be hoisted on high gear at 213 feet per minute, and 5500 pounds on low gear at 110 feet per minute.

Watt hour meters are connected in circuit on the Seekonk so as to give total power and that required by the winches only. On her maiden voyage these meters were read each day, also the consumption of fuel oil was recorded. During this voyage 9489 tons of cargo were handled, for which the kilowatt hours were 5470, and the cost of the fuel consumed, $855. Therefore, to produce this energy at a cost of a trifle over $\frac{1}{2}$ cent per kilowatt hour at the switchboard represents a cost of slightly over 3 10 cent for handling each ton of cargo.

Over 50,000 tons of miscellaneous cargo have been successfully handled within the first year's operation of the Seekonk, and we know of no expense for upkeep of the electric deck equipment, other than the usual allotment of spare parts.

The Motorship Challenger

The Challenger, a single screw steam vessel of 11,620 tons deadweight capacity, was purchased from the United States Shipping Board by the Sun Shipbuilding Company and converted recently into a motorship, driven by a 3200 shaft horsepower Sun - Doxford opposed-piston diesel engine. The deck machinery and engine room equipment are driven by Westinghouse motors. Diesel engine sets having Westinghouse generators are also used on this vessel.

Ten $1\frac{1}{2}$-ton winches and one capstan on this vessel are driven by 20 horsepower series wound motors. One warping winch has a 30 horsepower compound wound motor. This larger winch is compound geared, having capacities of $2\frac{1}{2}$ tons at 160 feet a minute, or 5 tons at 80 feet a minute. The marine type motors for these winches are of the same design as that previously described.

Provision on this vessel has not been made for protecting, in deck houses, the resistors for the winch equipment. Since there is no space for these resistors below the shelter deck, the Westinghouse company has furnished special water-tight resistor cases which can be properly ventilated when winches are in use and entirely closed when they are idle.

The usual allotment of electrical spares is carried by the Challenger. We have been informed by the chief engineer that during her recent trip around the world, the winches handled over 40,000 tons of cargo without replacing a single part on the winches—not a single spare package was opened.

On this last trip, an estimated distance of 25,000 nautical miles was covered in 5 months and 28 days, of which 18 days of bad weather were spent in the Indian Ocean, when the speed was reduced from an average of 10 knots to one-half of this speed. The waves washing over the shelter deck were defied by the water-tight motors and control equipment.

The trip included eastern United States ports, Panama, Honolulu, Philippine Islands, Java, Samatra, Malay Peninsula, and return to Philadelphia.

The winches were operated by Filipinos at Honolulu, Manila, Iloilo, Cebu, and Zamboanga; by Javanese at Java, Semarang, Cheribon, and Batavia; by Malays at Singapore; and usually foreign-born citizens of the United States at Philadelphia, New York, Boston, and Baltimore.

PROPELLERS FOR MOTORSHIPS

THE use of the diesel engine in marine propulsion and particularly for towboat propulsion has brought out a new problem in propeller design. That problem is to perfect a propeller blade which will give a better grip on the water and a better backing ability than are obtainable with the standard design at comparatively high speeds. Low speed of hull and high speed of engine mean low pitch ratio for the propeller, which, in the standard form of blade, means inability in backing and slow getaway in any direction.

Several years ago, last century in fact, the steamer Queen, coming off the Alaska run for her regular overhaul, was docked at the Union Iron Works, San Francisco, when it was found that the tips of the blades of her wheel were all bent uniformly aft for about 6 inches. The officers, on being questioned, claimed that since fouling a log the fuel economy and speed going ahead seemed to be greatly improved, but they could get no power backing.

The Cloverleaf design, now being built and installed in San Francisco by the Cloverleaf Propeller Company, has demonstrated in many installations that it gives increased efficiency going ahead and greatly multiplies backing power, particularly under the adverse conditions of high revolutions per minute and low pitch ratio. The Cloverleaf blade is a combination of a true pitch forward blade, with part of a true pitch backing blade, making a notched blade with two tips, one being curved sharply forward and the other sharply aft at their extreme ends. This design has the effect of entraining the water stream in either astern or ahead propulsion. The Cloverleaf design thus gives, with a lower initial cost, much of the benefits to be derived from the installation of shrouds or tubes, or contra blades.

In designing wheels of this peculiar form, blade thickness immediately became a serious question. The Cloverleaf engineer started on the safe side by adding 20 per cent to the thickness as figured for standard blades by the American Bureau of Shipping rules. This figure was gradually reduced to zero. Over 100 Cloverleaf propellers, ranging in diameter from 2 to 10 feet, and with thickness of blade figured on standard rule, have now been installed without a single fracture or bend being recorded. The castings for these wheels were made by the Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., from manganese bronze ranging 65,000 to 71,000 pounds tensile strength. From this showing it is concluded that the standard American Bureau rules are adequate for the Cloverleaf design.

Some of the advantages of this novel design, as demonstrated in nearly 200 installations, are as follows:

1. Backing power not diminished with low pitch ratio below .5;
2. Stopping headway very quickly;
3. Faster time with less fuel per mile traveled;
4. Backing power increased;
5. Steering while going astern.

An Efficient Muffler

THE Maxim Silencer Company of Hartford, Connecticut, reports the following recent installations of Maxim silencers:

One 12-inch size cast iron silencer on the exhaust of the 1150 horsepower McIntosh & Seymour engine in the new dredge Diesel of the United Dredging Company, Galveston, Texas.

One 5-inch size and one 8-inch size cast iron silencer on the exhaust of 135 horsepower and 375 horsepower Lombard engines installed in tugboats by the Long Island Machine & Marine Construction Company.

Two 8-inch size cast iron silencers in the new Standard Oil Company tanker on the exhausts of two 400 horsepower Pacific Werkspoor engines.

One 8-inch cast iron special silencer on the exhaust of a Fairbanks-Morse marine engine operated by the Texas Company of New York City.

These installations all show the adoption of the Maxim silencer for diesel engine exhausts in marine work. Silent operation for conservative navigation is necessary and valuable and is recognized as such by the better class of ship operators.

The widely known Maxim silencer stands pre-eminent among noise-reducing devices for this type of service. Repeat installations by concerns such as are mentioned above are indicative of the confidence in this device and the rapidly growing feeling against unnecessary noise.

Glue For Rum Chasers

THERE is nothing new or strange in the use of Jeffery's marine glue in deck seams of all types of craft, whether it be a small pleasure boat or the great Leviathan, where over 16,000 pounds of Jeffery's marine glue were used. There are times, however, when the features surrounding a particular installation justify special mention as appears in the case of the United States Coast Guard patrol boats.

Jeffery's marine glue was indorsed by the officials of the United States Coast Guard, the committee on purchases, and was the unqualified choice of the majority of the builders who finally received the contracts for construction. In addition to the use of Jeffery's marine glue in the deck seams, many of the builders have also used Jeffery's waterproof liquid glue, C quality, for laying and attaching canvas to house tops and hatch covers.

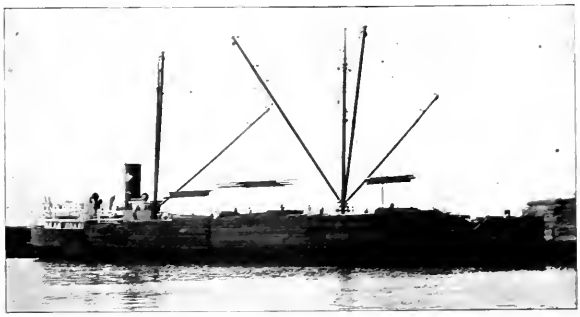
The contracts for these boats were placed in the principal boat yards on the Atlantic and Pacific Coasts, along the Gulf of Mexico, and the Great Lakes, and will constitute the most unique fleet that has ever been commissioned.

Not long ago a gasoline power boat was looked upon solely as a pleasure craft. However, in a short span of years it has found a place in the field of commercial craft and now is to be commissioned as a unit in our national defense. We will look with pride and interest on the results.

AN ECONOMICAL LUMBER CARRIER

THE steamer Dan F. Hanlon, recently completed at the Oakland yards of the Hanlon Drydock & Shipbuilding Company, Inc., is making a very fine record in the carriage of lumber under the management of W. R. Chamberlin & Company, operating owners.

This vessel was especially designed for the Pacific Coast lumber trade under the personal supervision of Dan J. Hanlon. She was built and equipped for the economical carriage and handling of 1,400,000 board feet on a draft of 18 feet, with machinery to give her a light loaded speed of 11 knots. All the calculations of her designer as to carrying capacity, trim, and speed have worked out with great nicety. Both owners and the builders of this fine vessel are justly proud of her record.



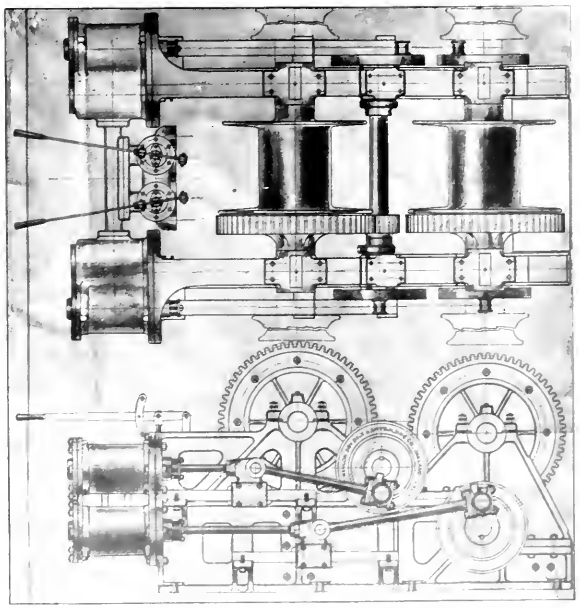
The steamer Dan F. Hanlon discharging lumber at Los Angeles Harbor.

Hull

The Dan F. Hanlon is of steel construction throughout except for the deck-house aft, which is of wood construction and houses the living quarters of the officers. The general characteristics are:

Over-all length	249 feet 6 inches
Molded beam	40 feet 0 inches
Molded depth	17 feet 6 inches
Gross tonnage	1434

The double bottom, extending from the engine room to forepeak bulkhead, is divided into three tanks athwartships, which are further divided by a center line fore and aft water-tight keel, making six compartments, in any of which fuel oil or water ballast can be carried at the option of the operator. This arrangement gives a very good combination for trim. Water ballast is carried in the forepeak and fresh water in the two afterpeak tanks.



Side elevation and plan showing general arrangement of the Hanlon patente[illegible]

Machinery

Two Babcock & Wilcox water-tube boilers, working at 215 pounds pressure and allowed 250 pounds by the United States Inspection Service, supply steam to a 1400 horsepower triple expansion engine. The engine room installation was designed particularly for accessibility and easy repairs. All of the pumps and other auxiliaries are located so as to be readily accessible on the lower platform. The dynamo flat is located on a platform over the pumps. Two 10 kilowatt generators are installed. A flash evaporator of self-cleaning type takes care of make-up feed water, and an independent Blake type air pump insures a good vacuum on the condenser.

On her trials, light, the vessel was driven at a sea speed of about 11 knots per hour and at the present time she is giving very close to this speed under loaded condition.

Lumber Handling

The Dan F. Hanlon was especially designed to take care of lumber economically under Pacific Coast conditions.

The mast forward has two sets of booms and the after mast one pair of booms, each boom being 70 feet long. These three sets of booms are served by three of Dan J. Hanlon's patented winches. One of the illustrations used herewith shows the general arrangement of the

winch, which is in effect two winches on one bedplate arranged in such wise that they occupy practically the same width athwartship as a single winch and yet are able to give the same service as two separate winches. This saving of deck space is a very important feature in lumber carriers where the deckload forms such a large proportion of the total cargo.

The three Hanlon winches on the Dan F. Hanlon are designed to handle six-ton loads and they make excellent dispatch records in service. The Dan F. Hanlon easily discharges a million feet in a 10-hour shift. In order to facilitate the handling of lumber out of the holds, three hatches 18 feet by 28 feet are provided.

The accommodations of crew and officers are roomy and comfortable and fitted with all modern conveniences, nothing being left undone to keep the personnel contented.

The steamer Dan F. Hanlon with 1,430,000 feet of lumber aboard.

HANLON PLANT CONTINUES OPERATION

Following recent death of Daniel J. Hanlon, founder of the widely known construction and repair yard on Oakland estuary, it is announced that the operation and personnel of the plant will remain unchanged. Judge A. F. St. Sure, friend and former attorney of Mr. Hanlon, was named in the will as executor of the estate. J. R. Collins, vice-president, will be in active charge of the plant. Fletcher Monson, secretary, will have jurisdiction over the firm's affairs in San Francisco, giving his entire time to the office at 112 Market Street. O. M. Jackson, sales manager, remains in charge of estimating. G. M. Skinner has supervision of steel and engine work at the plant and J. H. Price the woodwork—an organization selected by Mr. Hanlon.

CORY BRANCH SERVICE

THE house of Chas. Cory & Son has held, for many years, an excellent reputation in many lines of marine equipment. For some fixtures Cory is the standard specification. This reputation has been built up through the years by the uniform excellence of Cory products and their adaptability to ship use.

In addition to excellence of product, however, there has been built up a series of branch warehouses and service departments, which now covers the more important ports in the United States. This system of branches is so extensive that at practically every seaport, ship operators can readily obtain engineering service from Cory experts and spare parts from Cory stock for any equipment in the Cory line. The service is interlocking so that, for instance, any equipment installed in San Francisco will be checked and adjusted on arrival of vessel at New Orleans, Seattle, Philadelphia, New York, or Boston.

Operators of ships know, to their cost, that slight disarrangements of automatic control or intercommunicating equipment on shipboard often mean the difference between loss and a healthy profit. Sometimes these disarrangements are so slight as to escape discovery by any of the ordinary methods used by marine engineers, hence the value of this system of branches, which maintains highly trained specialists in Cory equipment, ready at all times to put Cory apparatus in perfect operating condition and to check on performance of Cory appliances.

At San Francisco, the branch office of Chas. Cory & Son, Inc., covers California under the direction of Jerome M. Lalor, district manager. The extensive stock of spares and the engineering ability of experts are available on short notice for serving Cory marine equipment at any port from San Diego to Crescent City.

MARINE INSURANCE

DEVELOPMENTS OF THE MONTH

By CHARLES F. HOWELL, Contributing Editor

COTTON fire losses marked the inauguration of the fall season in various parts of the middle South, and marine underwriters, upon whom this class of loss falls, are growing dubious as to the prospect general net profit on operations this year. The chief fires have been at Arkadelphia (876 bales), at Notasulga, Alabama (600 bales), at Waurika, Oklahoma (900 bales), and at Texarkana, Texas (2000 bales). These serious casualties have alarmed the underwriters the more because they have followed so soon upon the substantial reduction in the shore risk rates. Marine companies are the original underwriters on a large portion of the cotton in transit or in compress, and yet a very considerable part of the premium revenue finds its way into the pockets of the fire underwriters through reinsurance channels or through fire insurance control of many marine companies.

Not long since there was considerable commotion in the fire insurance camp over what was termed the invasion of their prerogatives and special province by marine underwriters, the charge being that the latter were handling too much of the shore fire risk; and there is somewhat of truth in the contention in view of the broad coverage granted by the marine policies. But the real advantage rests with the assured, after all. The marine cotton contract attaches from the time the cotton is purchased by the shipper, and, in many instances, that is equivalent to saying from the time the cotton leaves the gin premises. Prior to shipment the cotton is often stored for weeks by the shipper, and during this interval of storage the commodity is covered by the marine transit policy.

The advantage to the assured lies in the great saving in office detail, as well as in the circumstance that his cotton is always protected by insurance and at rates considerably lower that would ordinarily obtain for short-term coverage under a fire policy. Marine insurance must also be credited with the splendid improvements that have been made of recent years in the type of warehouse and compress used for storing and handling cotton. This has come about through a careful system of inspection and classification of premises, along with a sufficient differential in the insurance rates on the better premises so as to influence the improvement of conditions in old premises, as well as the encouragement of improved new construction.

Canada Unsatisfied

Both the London insurance market and the Imperial Shipping Committee of England are having their own troubles in trying to satisfy the wholesale demands of Canada for sweeping changes in the rates affecting hulls and cargoes bound to ports in the Dominion. British underwriters made substantial concessions along these lines and endorsed the findings of the Imperial Shipping Committee, which included the complete exclusion of the Port of Halifax from the operation of the higher charges, and the extension of the summer season so that it now runs from May 16 to October 31, instead of from May 1 to September 30 as of old. But this has not proved enough for Canada. No sooner had the report of the committee been made public than the Dominion Government announced that it would continue to press for further concessions and the removal of all insurance restrictions upon Canadian trade.

The Imperial Committee admitted that important improvements had been made in the channel of the St. Lawrence during recent years, but pointed out that proportionate improvements had also been made during the same period in many other parts of the world and that there has been a general reduction in marine insurance rates. But Canada insists that the decline in Canadian rates has not been in proportion with the general decline. The British underwriters, grown somewhat impatient under the excessive demands of the Dominion, retort that there still remain the ancient and serious risks arising from the ice, fog and tidal currents in the outer approaches to Canadian ports. The Imperial Committee very properly points out to Canada that as the risks are borne by individual interests it would not be practicable to modify or abolish the additional premiums until there was a widespread opinion that the dangers of the Canadian route had been overestimated.

Hull rates, as we have pointed out, have been materially reduced to meet the demands of Canada, at the cost of a considerable volume of premium on the part of marine insurers, but now Canada wants the same thing, or more, to be done for cargo business. Since early in October homeward cargoes from Canada have been covered at summer rates for sailings up to October 30, which is a full month later than previously conceded. The defiant and persistent attitude of the Ottawa authorities will probably have the result of stiffening the opposition of the underwriters to further concessions, particularly as regards the navigation of the St. Lawrence and the Belle Isle passage.

Discouraging "All Risks"

There has been a significant opposition to the continuance of granting the objectionable "all risk" cover, especially in the New York insurance market. During the last few years there has been too much freedom in allowing this dangerously broad protection. For several weeks the older offices have been quietly cancelling this frill, with

the result of obliging commercial firms who have been passing their "trade losses" to the underwriters to seek other protection or else return to genuine marine insurance and take "with average" cover. Among underwriters this is regarded as a wholesome sign as indicative that at least the more experienced underwriters are content to sacrifice premium volume rather than continue what is regarded by them as a particularly pernicious practice.

Barge Canal Conditions

So much argument has been expended upon the underwriting phases of covering risks on the New York State Barge Canal that it has been thought wise to have that waterway carefully inspected by insurers with the hope of arriving at a better understanding of the hazards peculiar to those waters. To this end a party of underwriters and brokers recently spent several days on the canal and made a thorough study of conditions there, particularly on the Oswego branch and the facilities at Oswego. The conclusion was that the State has made, of late, many improvements and is still active in so doing. It was seen that the risk which the underwriters have most to consider is the moral hazard involved relative to the operation of the carriers and their employes, the number of units in a tow and the size and condition of the boats; these things appear to the insurers as of more importance than the actual physical conditions of the canal.

The menace of the huge single units was graphically brought out at several points, and it became clear that the canal was never intended for such large craft which invite danger both to themselves and to passing vessels, as well as to the canal itself. The very nature of the navigation of the canal requires the constant over-sight of representatives of underwriters to see that their interests are properly protected.

Said one of the visiting underwriters: "I consider it absolutely essential that adequate supervision should be established at Buffalo to see that only boats that are fit to carry cargo are permitted to load, and that each towing unit is approved by the underwriters' representative before the underwriters' risk attaches."

New Lake Routing

A few days ago, for the first time in lake history, steamships were loaded on the Detroit River for an ocean voyage to foreign and Gulf ports. This is a new routing and it has interested marine underwriters very much. The vessels were the freighters Onondaga and Onda bound for New Orleans from the Ford Motor Company's docks at Detroit, and on to Buenos Aires. These ships were purchased by the Ford company from the Shipping Board and converted into oil burners. After making this combined inland and ocean voyage the boats will not return to Detroit, but will be kept in ocean service plying between Kearny, New Jersey, where there is a large Ford assembling plant, and South American ports. On outward trips they will carry Ford products and will return loaded with South American goods.

Singular Lake Casualty

It will cost marine insurance companies a pretty penny to meet the claims arising out of an unusual casualty which recently occurred at Gary, Indiana. The lake steamer B. H. Taylor is the victim. She is of the type known as a self-unloader and is equipped with a tremendous steel boom for use in the operation. While unloading at Gary, this heavy apparatus became loose and crashed down upon her deck, causing considerable damage. Repairs are being made at the Lorain yard, where she was built, and it is announced that the cost of the repairs will be heavy. The hull insurance was placed in the New York market.

This was not a loss resultant from one of the insured perils under the lake hull policy, and yet the underwriters will undoubtedly be liable through the Inchmaree clause in the lake form. This clause is as follows:

"This insurance also specifically to cover (subject to the above free of average warranty) loss of or damage to the hull or machinery, through the negligence of master, mariners, engineers or pilots, or through explosions, bursting of boilers, breaking of shafts, or through any latent defect in the machinery or hull, provided such loss or damage has not resulted from want of due diligence by the owners of the ship or any of them, or by the manager."

Oppose Edmonds Bill

It is claimed by Frank E. Gardner, executive secretary of the New York Board of Trade and Transportation, that the Edmonds bill, which is soon to be reintroduced at the short session of Congress, is discriminatory and under the various provisos and exceptions would allow all kinds of bills of lading disguised under other names. He insists that the bill legally allows shippers to make any sort of agreement they care to with the ocean carriers under Section 6, but it would be called a "receipt" and would be a non-negotiable instrument; that it provides for the waiving of rights and immunities, and that the responsibility of the carrier shall only begin when the goods are loaded on the ships and discharged on the docks, all of which would work against the interests of the small shipper. The bill, he contends, does not show who would be responsible for the goods when they were detained on the docks for any period of time.

This is a matter which intimately concerns shippers and commercial organizations desirous of securing

an uniform bill of lading. Mr. Edmonds has replied to a communication from Mr. Gardner, suggesting that those interested in securing adequate legislation on this pertinent question band themselves together and petition Congress in line with their needs in this direction.

Registered Air Mail

It is generally felt that careful study of the conditions surrounding the carriage of securities and registered mail by airplane service should be gone into, in view of the success that has attended the use of the aerial route, both in this country and abroad. Anything that tends to relieve the great and dangerous factor of congestion of registered mail should be welcomed by underwriters. There are serious considerations in connection with the use of the airplane, and among them is the moral hazard. It is more easy for airmen to exploit the precious contents of their mail bags, by dropping down in isolated sections under the plea of engine trouble and cooperating with bandits and other confederates, than would be the case with mail carried by rail. It is easy to see how mail could thus be entirely made away with and possibly never recovered.

In the main, however,, it is generally felt that the air route is as safe as the railroad, and the disposition in certain quarters is decidedly in favor of making no extra charge for registered air mail. For example, this is the expressed view of T. B. Dean, manager of the inland and ocean marine departments of the Royal Insurance Company at San Francisco. He cites the success of the system employed in London and Paris for the rapid dispatch of air mail, mail leaving at half hour intervals between those two cities. There is unquestionably an urgent demand for the extension of air service in this country.

Hurricane Losses

Another hurricane season has been passed through, and marine underwriters are breathing a little more freely in consequence. It has been rather worse, this year, than usually. The wind-up of the dreaded period brought a $180,000 loss in the sinking of the motor schooner James Timpson. She was of 1646 tons net, and was bound for New York from Belize, Honduras, with a valuable cargo of mahogany logs. She was one of the few remaining types of the auxiliary wooden class. The hull was insured in the New York market for $80,000 and the cargo for $100,000. The loss occurred off the inland of Roatan, and her crew, fortunately, was rescued by a passing steamer.

Many underwriters limit their liability against hurricanes to a great extent, and others refuse altogether to entertain a sailing vessel risk during the three dangerous months of June, July and August. Tariffs applicable to sailing vessels are divided into seasons, and the rates for the hurricane season are the highest of the year, not excluding the severest periods of winter travel. Not only does the hurricane wreak havoc along the shipping lanes, but it is the direct cause of the tremendous rise of water in the Gulf which results too often in disastrous floods in the Southern States and causes vast losses to underwriters on account of flood risks on cotton.

News in Eastern Offices

One of the best liked and most friendly marine insurance men in the East passed away recently when death claimed Frank H. Osborn. He was but fifty-one years of age, but had had an important underwriting career. Heart disease was the immediate cause of his death. He was born at Greenville, Michigan, and was engaged in marine insurance from the age of nineteen. His first work was in the Middle West, but later he came East and was connected with F. Hermann & Company, was the manager of the Atlantic marine department of the Fireman's Fund for several years, and at the close of his life was in the brokerage business in New York City in the firm of Osborn & Lange, Inc. He was the organizer of the Federal Lloyds of Chicago, later incorporated as the Federal Union Insurance Company. He was especially skillful in hull insurance and was one of the leaders in preparing the American hull builders' risk form.

Paris underwriters have unanimously voted for the adoption of the York-Antwerp Rules, 1924. This is first blood for the Rules.

Douglas G. Fash, for six or seven years an assistant underwriter for the Union Hispano and the late W. D. Despard, has joined the staff of R. A. Fulton & Company, New York City marine brokers.

On January 1, by mutual agreement, the Union Marine, Phoenix Assurance (marine department), Norwich Union Fire (marine department), and the Columbia (marine department), who have been associated for the past seven years with the Thames & Mersey Marine, the Liverpool & London & Globe (marine department), and the North China in a joint office, are to open their own office in New York for the transaction of marine business, with W. C. Spelman as United States marine manager. Mr. Spelman is at present deputy assistant marine manager for all the above named companies. The new office is to be at 49 Beaver street.

A. G. Hancock, general agent of the Home of New York, has returned from his European trip, bringing with him the body of his wife, who passed away while they were at Genoa.

Recent accessions to the Board of Underwriters of New York include George C. Owens, assistant secretary of the Globe & Rutgers, as an additional representative of that company, and Bjarne Holst, who succeeds M. J. Horn, for the Norwegian Atlas.

All the former officers and directors were reelected at the recent annual meeting of the American Institute of Marine Underwriters, thus: president, Louis F. Burke; vice-president, Douglas F. Cox; secretary-treasurer, Charles R. Page; assistant secretary, E. G. Driver.

Freights and Charters

November 19, 1924.

SINCE our last report dated October 16, the wheat demand for space and full cargoes has fallen off, owing to to the substantial raise of the F. O. B. price of wheat on this coast, which has made it difficult for our exporters to compete C. I. F. with other grain markets. The following fixtures have been reported:

British stmr. Castlemoor, 37 6, Dec. loading; Japanese stmr. Tofuki Maru, Nov., terms private, by Strauss & Co.; Japanese stmr. Karachi Maru, same; Japanese stmr. San Francisco Maru, Oct., terms private, by Kerr, Gifford & Co.; a Japanese steamer, 39 6, Nov.-Dec.; British m.s. Vinemoor, 38 9, Dec.; British stmr. Westmoor, Dec., terms private, by Suzuki & Co.; Japanese stmr. Kohnan Maru, 39 6, Nov., by F. W. Rudolph; Japanese stmr. Yogen Maru, Nov., terms private, by Wood-Baxter Co.; Japanese stmr. Tenpaison Maru, terms private, Nov.-Dec., by Balfour, Guthrie & Co.; Norwegian stmr. Hercules, 36 3, Dec., by Kerr, Gifford & Co.; Japanese stmr. Portland Maru, 36 3, Dec., by Kerr, Gifford & Co.

In grain to the Orient, the following fixtures have been reported: Japanese stmr. Yogen Maru, Columbia River to Orient, terms private, Nov. loading; Danish m.s. Indien, North Pacific to Japan, $4.25, Nov., by Strauss & Co.; Japanese stmr. Kaikyu Maru, Columbia River to Japan, wheat, terms private, by Suzuki & Co.; Japanese stmr. Yoyoi Maru, Columbia River to Japan, Dec. loading, terms private, by Kerr, Gifford & Co.

In general, chartering of full cargoes for lumber as well as wheat have been few and business at the present writing is dull in all directions.

Fixtures for lumber are as follows: Japanese stmr. Meiyo Maru, $10.50, Nov.-Dec. loading, by W. L. Comyn & Co.; Japanese stmr. Mihoh Maru, $11, Nov. loading, by W. L. Comyn & Co.; Japanese stmr. Ypres Maru, terms private, Nov. loading, by J. J. Moore & Co.; Italian stmr. Piave 11, $10.25, Nov., by J. J. Moore & Co.; British stmr. Sheaf Lance, same; British stmr. Sheaf Dart, same; Japanese stmr. Ryokai Maru, $10.50, same loading and same charterers; Japanese stmr. Hayo Maru, $11, Nov.-Dec. loading, by American Trading Co.

The Biyo Maru is reported fixed for lumber from the North Pacific to Japan at a rate of $8.75, Nov. loading, charterers not mentioned.

J. J. Moore & Co. have taken Chilean sailing vessel Dharma from Puget Sound to Callao, Nov. loading, at a reported rate of $7.

The following steamers have been reported as taken on time charter: Norwegian stmr. Luise Nielsen, delivery Australia, redelivery Europe, one trip, terms private, by W. L. Comyn & Co.; Norwegian stmr. Eldorado, three months coastwise, by McCormick Steamship Co.; British stmr. Sheaf Mount, delivery Seattle late Nov., redelivery Australia via New Zealand, 4 -, Union Steamship Co. of New Zealand.

In tanker fixtures, American tanker Bethelridge is reported fixed from San Pedro to New York, crude, Nov., by Standard Oil Co. of N. J.; American tanker District of Columbia, same, Oct. loading; American tanker Hagan, San Pedro to Balboa, crude Nov., by Arrow Oil Co.; American tanker Tulsagas, San Pedro to New York, crude, Nov., Standard Oil Co. of N. J.; American tanker Tuxpan-oil, same; American tanker Miller County, California to North of Hatteras, 65½c, crude, Nov.-Dec. loading.

Sailing vessel Rosamond has been taken for lumber from Puget Sound to Honolulu by the Bloedel-Donovan Lumber Co.; Panaman steamer Pawnee for merchandise from British Columbia to Japan and China by W. L. Comyn & Co.; British steamer Sheaf Mount, for general cargo from San Francisco to New Zealand and Australia by Union Steamship Co. and Norwegian stmr. Luise Nielsen for merchandise from Portland to the United Kingdom, prompt loading by C. K. West & Co.

PAGE BROTHERS, Brokers.

SHIPBUILDING AND SHIP REPAIRING

Shipping Board Awards Contracts

THE Shipping Board plan for conversion of idle steamers to motorships to enable the American merchant marine to meet competition in foreign trade was inaugurated the middle of November with the awarding of contracts for diesel engine installation on eighteen standard freighters to seven of the leading marine engine building companies of the United States. Contract awards were as follows:

Pacific Diesel Engine Co., Oakland, California — two single-acting Werkspoor, 2900 brake horsepower each, and auxiliary engines, representing a cost in excess of $500,000.

Worthington Corporation — Two double-acting, 2-cycle, 2900 brake horsepower each.

Busch-Sulzer—Four single-acting, 2-cycle, 3000 brake horsepower each.

New London Ship & Engine Building Co. (M. A. N.)—One double-acting, 3000 brake horsepower.

Hooven-Owens-Rentschler Co. (M. A. N.)—One double-acting, 3000 brake horsepower.

Wm. Cramp & Sons Ship & Engine Building Co. (Burmeister & Wain)—Four single-acting, 2800 brake horsepower.

McIntosh & Seymour—Three single-acting, 2700 brake horsepower, and one double-acting, 2700 brake horsepower.

The engines will require from seven to nine months for building and several months for installation, so that the dieselized Shipping Board freighters will not be ready for service for about a year.

MATSON LINER

Bids will be opened on December 5 at the office of Gibbs Bros., New York, for the construction of the new passenger liner for the Matson Navigation Company's service between San Francisco and Honolulu. The original plans and specifications of the vessel have been revised by Gibbs Bros. to such an extent that it has been necessary to call for new bids.

The revised specifications call for a passenger capacity of 650 instead of 500, as originally planned. The vessel will be considerably larger, having a length over-all of 582 feet; beam, 83 feet; draft, 26 feet. She will be propelled by turbo-electric engines supplying 25,000 horsepower, which will be sufficient to drive the vessel at a speed of 21 to 23 knots. The average speed at sea will be 21 knots, which will be sufficient to drive the vessel the 2091 miles from San Francisco to Honolulu in four and a half days.

The requirements of the plans will make the vessel easily convertible into an auxiliary cruiser in time of war. Several Pacific Coast shipyards will probably submit bids on the new liner.

MOORE LOW BIDDER ON TANKER

Moore Dry Dock Company, San Francisco, was low bidder for the construction of a twin-screw, shallow draft, diesel driven tanker for the Union Oil Company of California. The tanker is to be 175 feet long, 36 feet wide, and 6 feet 6 inches depth. She will have a capacity of 150,000 gallons of refined oil and 15 tons of package freight and a speed of 8 knots.

The bids submitted were as follows:

Moore Dry Dock Company, $145,998, time 125 days;

Bethlehem Shipbuilding Corporation, $174,979, time 125 days;

Los Angeles Shipbuilding & Drydock Corp., $175,000, time 120 days;

General Engineering & Drydock Company, $180,000, time 150 days;

Pacific Coast Engineering Company, Oakland, $194,749, time 180 days.

DIESEL ENGINE FOR PATROL BOAT

The City of Portland, Oregon, recently awarded contract for diesel engine and an auxiliary lighting plant for the harbor patrol boat to the Atlas Imperial Engine Company, Oakland, California. The following bids were submitted:

McLin Hardware Co., 100-horsepower engine, $8660; auxiliary plant, $68.50.

Oregon Marine Fisheries Supply Co., 90 horsepower engine $8117; 110 horsepower engine $8898; auxiliary equipment, $90.50.

Seattle Machine Works, 90 horsepower engine $7900.

Atlas Imperial Engine Co., 110 horsepower engine $7860; 90 horsepower engine, $7000; auxiliary plant $60.

Zimmerman-Wells-Brown Co., 100 horsepower engine $8287; 90 horsepower engine $7472, including auxiliary plants.

Fairbanks-Morse Co., 100 horsepower engine $7920; auxiliary $145.

Power Equipment Co., for Pacific Diesel Engine Co., 110 horsepower engine $9990; auxiliary $100.

CORY EQUIPMENT ON STEAMER DISTRICT OF COLUMBIA

The steamship District of Columbia, which was recently launched at the Pusey & Jones Company's yard at Wilmington, Delaware, has been built for service between Norfolk, Va., and Washington, D. C.

She has largely been equipped with the products of Chas. Cory & Son, Inc. Some of the principal Cory items which comprise the major installation include running lights, switchboards, decorative fixtures, steamtight fixtures, mechanical telegraphs, navigation bells, general alarm systems, call bells, Cory electro-pneumatic fire alarm and voice tubes.

The steamship District of Columbia is of 1250 gross tonnage and measures 298 feet long, 51-foot beam and 13-foot depth.

NEW DRYDOCK FOR HONGKONG

The Hongkong & Whampoa Dock Company, Limited, Hangkong, China, is completing arrangements for the construction of a new graving dock near the present docks of the company, which will be known as No. 1 dock. The principal dimensions of the proposed dock are:

Length from floorhead to inside of caisson .....1200 ft. 0 in.
Length of inner portion from inside of caisson.....710 ft. 0 in.
Length of outer portion from inside of caisson.....470 ft. 0 in.
Breadth of entrance at cooping .....120 ft. 0 in.
Depth of water over sill (O. H. W.) (ordinary spring tides) .....45 ft. 6 in.
Depth of water over sill at mean sea level (i. e., 4 feet above Admiralty datum) .....37 ft. 6 in.

This company is also contemplating the erection of a 200-ton crane on No. 2 dock.

Work in Prospect

Mr. Leo M. Archer, Pacific Coast manager of the Panama Pacific Line, announced recently that the steamship Mongolia of the International Mercantile Marine will be immediately reconditioned at a cost of $200,000 for the requirements of the intercoastal passenger trade.

This work will be followed by the immediate construction of two modern passenger and cargo vessels for this trade. Although Mr. P. A. S. Franklin, president of the International Mercantile Marine Company, confirmed the report of the plans for the two new vessels just before sailing for Europe; no details have been definitely announced. It is thought that both direct diesel and turbo-electric drive will be considered. The vessels will be about 14,000 tons and will have special refrigerating equipment for the carriage of perishable products from California to the East Coast. The vessels will have a sustained speed of 17 knots and will have special arrangements for the carriage of tourists' automobiles.

The steamer President Arthur (an ex-enemy combination passenger and cargo vessel) has been sold by the Shipping Board to the American Palestine Line, Inc., New York City, for $60,000, coupled with obligation to recondition the vessel within six months to extent necessary to obtain American Bureau classification and Steamboat Inspection certificate.

George W. Beermaker, San Diego, will soon be in the market for an 111-ton motor freight boat.

Jack Young, of Young Bros., Honolulu, arrived in San Francisco recently for the purpose of contracting for a tugboat to be used in towing pineapple-laden barges between Molokai and Honolulu.

Recent Contracts

American Bridge Company, Pittsburgh, has an order for one towboat for the Carnegie Steel Company; and an order for six sand barges for J. K. Davison & Bro.

Defoe Boat & Motor Works, Bay City, Michigan, has recently received an order for a wooden cruiser for E. F. Corley-Lansing.

New York Shipbuilding Corporation has listed among recently awarded contracts, one carfloat for the Chesapeake & Ohio Railway Co.; one barge for the International Cement Corporation; one 13,000-ton deadweight diesel tanker, principal not named; one dredge hull for the United Dredging Co.

Tebo Yacht Basin Company, Brooklyn, has an order for a ferry steamer for the City of New York. The vessel is to be 148 feet between perpendiculars, 53 feet beam over guards, 37 feet 6 inches beam molded, 8 feet 6 inches loaded draft with a loaded speed of 12 miles and a gross tonnage of 588.

Keel Layings

Coast guard cruiser, by A. W. de Young, Oakland, Nov. 3, and Yuba, snag boat U. S. Engineers, Nov. 10.

Launchings

Carfloat, Erie Railroad, Bethlehem Shipbuilding Corp., Harlan Plant, Oct. 23.

Robert E. Lee, combination steamer, Old Dominion Steamship Co., by Newport News Shipbuilding Co., Oct. 16.

Deliveries

Coast Guard cruiser by A. W. de Young, Oakland, Nov. 1; pile driver to San Francisco Harbor Board, Oct. 10.

Medusa, repair ship for Pacific Coast fleet, Navy Yard, Puget Sound, commissioned Sept. 16.

Two carfloats, Baltimore & Ohio Railroad, by Bethlehem Shipbuilding Corp., Sparrows Point Plant, Oct. 2 and 26.

Yacht, for J. G. Monohan, Defoe Boat & Motor Works, Oct. 25.

Edward L. Berwind, freighter, Franklin Steamship Co., Cleveland, by Great Lakes Engineering Works, Oct. 6.

Repair Awards

Bethlehem Shipbuilding Corporation was awarded contract on November 18 to repair the Nelson Steamship Company's freighter Castle Town. Bids submitted were: Bethlehem, $14,680 and 15 days; Moore Dry Dock Company, $15,987 and 15 days; General Engineering & Drydock Company, $17,124 and 18 days.

Wallace Shipyards, Vancouver, B. C., have a contract for the conversion of the wooden vessel Dingamon into a log carrier for Captain Walter Wingate. The Dingamon was an uncompleted Shipping Board vessel. She is about 4000 tons deadweight and will carry about 1,225,000 feet of logs when in commission.

The steamer Venezuela of the Pacific Mail Steamship Company is scheduled to undergo reconditioning on completion of her next trip at San Francisco. It is estimated repairs will cost in the neighborhood of $90,000.

The Albina Marine Iron Works, Portland, recently handled repairs to the Japanese steamer Boston Maru, which was damaged in a collision with the steamer West Keats. The West Keats repairs were handled by the Willamette Iron & Steel Works.

Shipyard News

The Wallace Shipbuilding & Drydock Company, Ltd., Vancouver, B. C., has taken out a permit for the construction of machine shops and offices in connection with the new drydock, the construction of which is nearing completion. The new shops and offices will cost in the neighborhood of $100,000 and work will start at once.

The new passenger and freight steamer Bienville, recently completed at the Tacoma yards of the Todd Dry Dock & Construction Corporation for the Southern Pacific Company held her trial voyage and speed tests in Puget Sound. After drydocking and painting the Bienville will load cargo for the East Coast.

The Pacific Salvage Company's new steamship Salvage King was launched from the Bow-McLachlan yards, Paisley, Scotland, November 11. The vessel is 185 feet long, 36 feet beam, and 18 feet depth. She will be equipped with engines of 3000 horsepower which will give a speed of 15 knots. The vessel will be the best equipped salvage vessel ever constructed in British yards and will cost in the neighborhood of $500,000.

In connection with recent repairs to the Japanese steamer Ryuch Maru of the Portland-Orient Line, which was damaged after partially loading her cargo of wheat, four pontoons of the 15,000-ton drydock of the Port of Portland Commission lifted, with ship and cargo, a total of 10,250 long tons. The length of the Ryuch Maru over-all is 411 feet. As the vessel would not bear on all pontoons of the dock, it was necessary to arrange to lift her on four sections and part of her cargo of wheat had to be discharged. Had her length been sufficient to utilize the five pontoons there would have been no necessity for discharging cargo. The two drydocks at Portland, which are maintained by the Port of Portland Commission, are made available for emergency use of vessels entering the Columbia River.

Probably the largest steamship merger on record on the Great Lakes was announced during October in Chicago by the Goodrich Steamship Lines and the Graham & Morton Line. The merger of these two included twelve steamers and a capital of $5,000,000.

The first commercial vessel ever built in the United States by the electric welding method was launched on November 14 at Providence, Rhode Island. The vessel is 80 feet long, 26 feet beam, and 12 feet in depth. The tanks in the hold have a total capacity of 200,000 gallons. The vessel will be used by the Pennsylvania Petroleum Products Company in its tanker service.

The Standard Oil Company (California), after calling for bids for the motorization of the tanker K. R. Kingsbury, has announced that it has been decided not to go ahead with the conversion because it would not be wise to increase the investment in this vessel.

Vessels having a total gross tonnage of 23,849 were constructed in Hongkong during 1923, 90 per cent of the vessels being ocean-going for use in the coastal trade.

A contract for a naval flying boat, capable of making a sustained flight from the West Coast to Honolulu, has been signed by the Bureau of Naval Aeronautics. The specifications call for a proved capacity of five passengers and a ton of freight. The contract was placed with the Boeting Aircraft Corporation, Seattle. It will be equipped with two 800-horsepower 12-cylinder engines, the most powerful airplane motor unit ever built in this country. A contract speed of more than 100 miles an hour is required.

A 69-foot halibut schooner was launched November 5 at the Olson & Sunde Marine Works, Seattle. The vessel was built for John Iverson and C. M. Iverson of Seattle. She has a beam of 16 feet and a depth of 8 feet, and is equipped with a 90-horsepower Washington Estep full diesel engine and gurdy and cable winches built by Olson & Sunde shops. This yard laid the keel the following day of another halibut schooner, 72 feet long, for Ehler Bros. & Armstrong of Seattle and Alaska, to be similarly engined.

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The Markey Machinery Company, Seattle, recently completed its first heavy duty Sumner oil engine, which is manufactured under arrangements of H. W. Sumner Company. The engine is of 125 horsepower and is to be installed in a new tugboat being built at the Crosby shipyards.

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The United States Steel Corporation is to have four 10,000-ton diesel engined cargo vessels built within the near future, according to James A. Farrell, president of the corporation, in an address before the Society of Naval Architects and Marine Engineers in New York the early part of November. It was not stated, however, whether the vessels will be ordered in this country or abroad.

The Puget Sound Sheet Metal Works, Seattle, is building a full size model of the "Self-Bailing Lifeboat" and will use the craft for demonstration purposes. The construction of the boat is patented and it is claimed that with a full load it is impossible to swamp or sink the craft.

The Mohawk Oil Company of Los Angeles recently purchased the tanker Washtenaw from the Union Oil Company. The Mohawk Oil Company has heretofore confined its distribution to the district immediately surrounding Los Angeles, but recently applied for a license to build a pipe-line to Los Angeles, and, with the purchase of the tanker, has indicated its intention of branching out into the ocean shipping oil trade. The tanker has been laid up since April, 1922, and will be reconditioned before entering into service.

C. G. 263, first of the fifteen rum chasers ordered by the Coast Guard Sevice from the Lake Union Dry Dock & Machinery Works, Seattle, underwent her speed and endurance tests on Lake Washington November 2 and 3 and was delivered to the Coast Guard Service November 4. Eleven more rum runner chasers are now almost completed.

Mitsui & Company, Ltd., have entered into a contract with the William Cramp & Sons Ship & Engine Building Company for three 13,000-horsepower vertical I. P. Morris turbines, together with governors, intake pipes and penstock valves. This installation is for the Aso Power Station of the Cifu Electric Power Company. The Aso station will be located on the Hida River, which is tributary to the Kiso River. This contract represents the first order for hydraulic machinery placed with the Cramp company by Japanese interests and will constitute a part of the extensive superpower developments of Japan.

Progress of Construction

Pacific Coast

BETHLEHEM SHIPBUILDING CORPORATION, LTD. UNION PLANT Potrero Works

Purchasing Agent: O. W. Streett

Hawaii, hull 5321, cargo steamer, Hawaiian Meat Co., Honolulu, 190' LOA; 26' beam; 13' 6 loaded draft, 12 mi. speed; TE engs.; 2 water-tube boilers; keel June17/24, launched Sept 24, deliver Oct26/24, est.

El Paso, hull 5323, ferry steamer, Richmond & San Francisco Transp. Co.; 234' LOA; 44' 10" beam; 12' loaded draft; 12½ mi. speed; TE engs.; 3 Scotch boilers; keel June19/24, launch Oct. 24, deliver Dec1/24, est.

No name, hull 5324, ferry steamer, sister to above; keel June24/24, launch Dec16/24, est. deliver Jan25/25, est.

No name, hull 5325, sister to above, keel Sept/24.

Hilonian, oil tanker, hull 5326, diesel-electric tanker; 441' 6" OA (Cal.); 430' LBP; 56' beam; 37' 6" load draft, carrying 10,000 bbls. oil; 460 HP Lane Workspeed diesel engs.

A. W. de YOUNG BOAT & SHIPBUILDING CO., INC. Alameda, Calif

Purchasing Agent, R. L. J. McClure

No. 253, hull, fuel barge, Associated Oil Co., S. F.; 140' LBP; 30' beam; 7' 6" loaded draft; Pacific diesel engs.; 220 BHP; keel May12/24; launched Sept2/24; delivered Sept23/24.

NAVY YARD Puget Sound

Medusa, repair ship for government; 460' L BP; 70' beam; about 19' loaded draft; 17-5 loaded speed; turbine eng., 7000 IHP; 2 WT express type boilers; 10,000 tons disp.; keel Jan 2/24, launched Apr16/25; commissioned Sept 16/24.

Holland, submarine tender for government; 460' LBP; 61' beam; about 20' loaded draft; 16 K loaded speed; turbine eng., 7000 IHP; two WT express type boilers; 10,000 tons disp; keel April1/21; delivery April/25, est.

TODD DRYDOCK & CONSTRUCTION CORPORATION Tacoma, Wash.

Bienville, hull 43, passenger and freight stmr, Southern Pacific Co.; 445' LOA; 57' beam; 25' loaded draft; 16 knots speed; 7000 DWT; keel Feb26/24, launched July16/24; deliver Nov/24, est.

Atlantic, Lakes, Rivers

AMERICAN BRIDGE COMPANY Pittsburgh, Penn.

Purchasing Agent: W. G. A. Millar.

Twenty oval barges, Carnegie Steel Co.; 175'x26'x11'; 16 delivered.

Thirty barges, Carnegie Steel Co.; 175'x26'x11' ft; deliver 1924, est.

Two dump scows, U. S. Engineers, Pittsburgh; 100'x26'x5'-10"; deliver Aug27/25, est.

One car transfer barge, Missouri Illinois R. R. Co.; 225'x38'x10'; 2 tracks; deliver Dec1/24, est.

Three barges, Kosmos Portland Cement Co.; 175'x32'x8'; deliver spring 1925.

One towboat, Carnegie Steel Co.; 170'x39'x6' 1"; deliver spring 1925.

Six sand barges, J. K. Davison & Bro.; 135'x26'x10'; deliver June 25.

THE AMERICAN SHIP BUILDING COMPANY Lorain, Ohio

W. H. Gerhauser, vice-president and director of purchases.

No name, hull 78?, freighter, Hutchison & Co.; 580' LBP; 60' beam; 20' loaded draft; 13 loaded speed; 13,600 DWT; 2200 IHP TE eng; 3 Scotch boilers, 13' 6"; deliver Apr/25, est.

BATH IRON WORKS, LTD Bath, Maine

Purchasing Agent: J. L. P. Burke.

No name, hull 98, passenger and freight steamer, New England Steamship Co.; 202' LBP; 36' beam; 10' 10" loaded draft; 15 knots loaded speed; capacity 2000 passengers, 100 tons freight; one 4-cycle, TE eng, 1200 IHP; 2 B&W boilers, 4450 square feet HS; keel Oct 15/24, est, launch April/25, est; deliver May 1/25, est.

BETHLEHEM SHIPBUILDING CORPORATION, FORE RIVER PLANT Quincy, Mass.

Lexington, hull 1300, airplane-carrier U.S.N. Massachusets, hull 1400, battleship U.S.N.; to be scrapped.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT Wilmington, Del.

Hull 3492, carfloat, Erie Railroad; 325' LBP; 56' beam; 1650 gross tons; keel July12/24; launched Oct22/24.

Hull 3493, carfloat, sister to above; keel July 23/24.

Hull 3494, carfloat, Bush Terminal; 275'x37-6"x16'-6" keel June9/24.

Hull 3495, sister to above; keel Sept10/24.

BETHLEHEM SHIPBUILDING CORPORATION, SPARROWS POINT PLANT Sparrows Point, Md.

Hull 4230, carfloat, B. & O. R. R.; 283'x37-6"x10'-3", keel June9/24; delivered Oct2/24.

Hull 4231, sister to above; keel July1/24; launched Oct14/24, delivered Oct26/24.

Hulls 4232-4233, steel dump scows, Arundel Corporation.

HP Stroke, high speed engines, for Yag [illegible] 24; delivered Nov1/24.

No. 254, hull 2, sister to above, keel Aug14; launch Nov 24, est; deliver Nov15/24 est.

No. 255, hull 3, sister to above, keel Aug14; launch Nov 24, est; deliver Nov14, est.

No. 256, hull 4, sister to above, keel Aug14; launch Nov 24, est; deliver Nov10/24, est.

No. 257, hull 5, sister to above, keel Aug14; launch Nov 24, est; deliver Nov1/24, est.

No. 258, hull 6, sister to above, keel Nov3/24, deliver Feb 25, est.

No. 259, hull 7, sister to above, keel Nov 24, est, deliver Feb 25, est.

No. 260, hull 8, sister to above, keel Nov 24, est, deliver Feb 25, est.

No. 261, hull 9, sister to above, keel Nov 24, est, deliver Feb 25, est.

No. 262, hull 10, sister to above, keel Nov 24, est, deliver Feb 25, est.

Pilot, driver, San Francisco Harbor Board; 85'x25'; keel Sept2/24; launched Sept26/24, delivered Oct14/24.

Yuba, snag boat, U. S. Engineers; 100 length, 35' beam, 5' depth, stern wheel, oil burning; accomodations for 40 crew; keel Nov19/24, to [illegible] March 25, est.

J. C. JOHNSON'S SHIPYARD Port Blakely, Wn.

Five scows, Washington Tug & Barge Co., Seattle; 105'x36'x10'; one delivered Oct3/24, three delivered.

No name, cannery tender, P. E. Harris & Co., Seattle; 86'x19'-6"x10'; 165 HP Atlas Imperial diesel engs.; keel Nov3/24, est; deliver Feb1/25.

THE MOORE DRY DOCK CO. Oakland, Calif.

Purchasing Agent: N. Levy.

Port Costa, hull 167, oil barge, Associated Oil Co., S. F.; 140' LBP; 30' beam; 7'-6" loaded draft; Pacific diesel engs; 220 BHP; keel May12/24; launched Sept2/24; delivered Sept23/24.

NAVY YARD Puget Sound

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Hulls 4232-4233, steel dump scows, Arundel Corporation.

CLINTON SHIPBUILDING & REPAIR COMPANY
Philadelphia, Pa.

No name, hull 45, oil barge, City of Phila.; 88 LBP; 30 beam; 8 loaded draft; keel June /24, est; launch July/24, est; deliver Aug/24, est.

CONSOLIDATED SHIPBUILDING CORPORATION
Morris Heights, N. Y.

Hull 2764, 30-ft cruiser, H. W. Hanan.

Hull 2773, Exp. cruiser, Harold Vanderbilt; 46x10-6; 180 HP Speedway engs.

Hull 2774, cruiser, J. B. Ford; 85x15; 2 300-HP Speedway engs.

Hull 2775, yacht tender, A. B. Deck; 23x5-8; 28 HP Speedway eng.

Hull 2777, cruiser, M. M. Belding; 50x12; 2 M-6 Speedway engs.

Hulls 2778-9, play boats for stock; 34x8-6.

Hull 2780, steel cruiser, W. O. Briggs; 118x21; 2 180 HP Winton diesel engs.

Hull 2787, coupe yt tender, Harry Payne Whitney, 29x7; Gold Cup Packard eng.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO.
Philadelphia, Pa.

Purchasing Agent: Ed. C. Geehr.

Memphis, hull 503, scout cruiser, U.S.N.; keel Oct4 20; launched Apr17 24, 91 per cent comp Nov1, 24.

DEFOE BOAT & MOTOR WORKS
Bay City, Mich.

Purchasing Agent: G. O. Williams.

C G 115-129 inc; 15 patrol boats for U. S. Coast Guard, 75 long, 13-6 beam, 1 delivered.

No name, hull 92, yacht for J. G. Monohan; 38 LBP; 11 beam; 3 loaded draft; 12 mi. speed; 60 HHP gas engine; keel Sept3 24, launched Oct15 24; deliver Oct25 24.

Hull No. 79, wooden cruiser, E. F. Corley, Lansing; 42 ft 10 in long, 10 ft beam, 3 ft draft; 12 mi speed, Scripps E-6 gas engs, deliver June 1 25, est.

DRAVO CONTRACTING COMPANY
Pittsburgh, Pa.

Hull 340, steel deck barge, builder's account, 100x26x6-6, 135 gross tons.

Hulls 341-4, 4 sand and gravel barges, builder's account; 135x27x8; 320 gross tons ea.

Hulls 345-349, inc., 5 sand and gravel barges, Ohio River Sand Company, Louisville, 130x30x7-6; 830 gross tons each.

Hull 352, mixer boat No. 5, owner's account; 150 gross tons.

FEDERAL SHIPBUILDING & DRY DOCK COMPANY
Kearny, N. J.

Purchasing Agent: R. S. Page.

El Oceano, hull 81, freight stmr, Southern Pacific Co.; 433 LBP; 56 beam; 26 loaded draft; 14¾ loaded speed; 7950 DWT; turbine engs, 6000 HHP, 4 B&W boilers, keel Sept[illegible] 24.

GREAT LAKES ENGINEERING WORKS
River Rouge, Mich.

Purchasing Agent: Chas. Short.

Edward L. Berwind, hull 247, freighter, Franklin S. S. Co., Cleveland; 612 LOA, 586 LBP; 62 beam; 32 depth; 20 loaded draft; 13,500 DWT, 12 mi speed; keel Feb25 24, launched July 12 24, delivered Oct6 24.

Joseph H. Frantz, Hull 248, bulk freighter, Columbia S. S. Co., Cleveland; 618 LOA, 592 LBP, 62 beam, 32 depth, 20 draft, 13,500 DWT, 12½ mi speed, keel June1 24, launched Oct 18 24, deliver Mar1 25, est.

HOWARD SHIP YARDS & DOCK COMPANY
Jeffersonville, Ind.

Purchasing Agent: Jas. E. Howard.

Steel tow boat; 140 long, 32 beam, 6-6 depth hold.

Two steel river boats, U. S. government.

No name, Algiers Public Service, Inc., New Orleans, 170 feet 6 inches long.

No name, ferryboat, sister to above.

MARIETTA MANUFACTURING CO.
Point Pleasant, W. Va.

Purchasing Agent: S. C. Wilhelm.

No name, hull 138, sternwheel towboat, 125x30x5-[illegible] tandem comp engs, Western rivers return [illegible] boilers; keel Mar1 24; launch Oct12 24.

No name, hull 139, sister to above; keel May 15 24.

No name, hull 142, oil barge, Standard Oil Co. of Ohio, [illegible] keel Oct17 24, launch Nov17 24, [illegible] Dec1 24, est.

MIDLAND SHIPBUILDING COMPANY, LTD.
Midland, Ontario

Purchasing Agent: [illegible]

Gleniffer, hull 12, bulk freighter, Great Lakes Transp. Co.; 560 LOA; 60 beam; 20-6 draft; 3 Scotch boilers; keel May8, 24; launch Nov 24, est; deliver May, 25, est.

NASHVILLE BRIDGE COMPANY
Nashville, Tenn.

Purchasing Agent: Leo E. Wege.

No name, hull 65, dredge, W. T. Hardison & Co.; 110 LBP; 30 beam, 6 loaded draft; keel July15/24; delivery Oct15 24, est.

Hull 80, deck barge, builder's account; 100 LBP; 24 beam; 5 loaded draft; keel July1 24 launch Oct12, 24, est.

No name, hull 81, dredge boat hull, T. L. Herbert & Sons; 110 LBP, 30 beam, 6 draft; keel July20 24; launch Oct12 24, est.

Colvert, hull 83, steamboat, U. S. Govt.; 120 LBP; 26 beam, 4 loaded draft, keel Dec1, 24, est; launch Feb15, 25, est; deliver Mar1 25, est.

Hull 84, barge, builder's account; 120 LBP; 30 beam, 7 loaded draft.

No name, hull 85, ferry, Bisso Ferry Co.; 140 LBP; 59 beam; 8 loaded draft, keel Oct 15 24, est; launch Dec1, 24, est; delivery Dec 15 24, est.

Hulls 86 to 89, inc., pontoons, U. S. Govt.; 40 LBP, 12 beam, 3 loaded draft; keels Sept 15 24, launch and deliver Oct10 24, est.

Hull 90, deck barge, 180 LBP, 36 beam, 7 loaded draft, keel Dec5 24, est, launch Jan15 25, est, deliver Jan15 25, est.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY
Newport News, Va.

Purchasing Agent: Jas. Plummer, 233 Broadway, New York City.

George Washington, hull 276, freight and passenger stmr, Old Dominion Steamship Co., 375-6 LBP; 53 beam; 29-9 depth; speed 16 knots, 2100 DWT; Newport News Curtis turbines, 4750 SHP, B&W boilers, keel March10 24, launched Aug20 24, delivery Nov 24, est.

Robert E. Lee, hull 277, sister to above; keel Mar12 24, launched Oct16 24, deliver Jan 25.

Cherokee, hull 274, combination steamer, Clyde S. S. Co.; 387-6 LBP; 54 beam, 31-6 depth; 14½ loaded speed; 2600 DWT; Newport News Curtis engs; 4200 SHP; 4 Scotch boilers; keel Aug12 24, launch Feb 25, est, deliver June 25, est.

Seminole, hull 275, sister to above; keel Sept 9 24, deliver Aug 25, est.

Nenemoosha, hull 281, yacht for Alfred I. du Pont; 130 LBP; 22 beam; twin screw; diesel engs; keel Oct6 24, launch Nov 24, est.

Norfolk, hull No. 282, dredge hull, Atlantic Gulf & Pacific Co. of New York; 162 long; 38 beam; 14 depth; deliver Dec 24, est, keel Nov 24, est.

Hull 283, freight house barge, The Chesapeake & Ohio Railway Co., 100 ft long, 30 ft beam, 8 ft 6 in deep, keel Dec1 24, est, deliver Feb 25, est.

Hull 284, sister to above, keel Dec 24, est, deliver Feb 25, est.

Hull 280, freight and passenger steamer, New York and Porto Rico Steamship Co., 412 LBP; 59 ft 6 in beam, 35 depth, speed 15 knots, Newport News Curtis turbines, 6000 SHP, Scotch boilers, keel Dec 24, est, deliver Nov 25, est.

NEW YORK SHIPBUILDING CORP.
Camden, N. J.

Purchasing Agent: L. G. Buckwalter.

Hulls 300-301, two carfloats, Lehigh Valley R. R. Co., 2 tracks, 185 ft long, keel fall 1924.

Hull 302, carfloat, Chesapeake & Ohio Ry. Co., 4 tracks, 370 ft long, keel winter 24-25, est.

Hull 303, barge, International Cement Corp., 162 ft long, keel fall 24, est.

No name, hull 304, diesel tanker, 480 ft long; 13,000 dwt, 3200 BHP.

No name, hull 304, diesel tanker, 13,000 dwt; [illegible] BHP.

Hull 305, dredge hull, United Dredging Co., 120 ft long, keel winter 24-25, est.

THE PUSEY AND JONES CO.
Wilmington, Del.

Purchasing Agent: James Bradford.

District of Columbia, hull 1028, steel combination steamer, Norfolk & Washington Stmbt. Co., Washington, D. C., 297-7 LBP; 51 beam, 13 loaded draft; about 18 mi speed; 1600 DWT; single screw; 4 cyl TE engs, 2400 IHP; 4 Scotch boilers, 12-6, keel May3 24, launched Sept13 24, deliver Dec21 24, est.

SPEDDEN SHIPBUILDING CO.
Baltimore, Md.

Purchasing Agent: W. J. Collison.

Hull 260, steel hull tugboat, Grace Line, Inc., N. Y.; 76-6 LOA; 19 beam; 10 depth, 320 HP Ingersoll Rand diesel engs, keel July15 24; launched Oct10 24, deliver Nov 24, est.

STATEN ISLAND SHIPBUILDING COMPANY
Staten Island, N. Y.

Purchasing Agent: R. C. Miller.

No name, hull 749, steel diesel-electric tugboat, Penn R. R. Co., 105 LBP; 24 beam, 13-5 loaded draft.

No name, hull 750, steel diesel-electric tugboat, Atlantic Refining Co.; 94 LBP; 21 beam; 11.5 loaded draft.

No name, hull 751, sister to above.

No name, hull 752, sister to above.

TEBO YACHT BASIN COMPANY,
Brooklyn, N. Y.

Purchasing Agent: R. C. Smith.

No name, hull 32, ferryboat, Dept. of Plant Structure, City of New York; 148 LBP; 53 ft beam over guards, 37 ft 6 in beam molded; 8 ft 6 in loaded draft; 11 mi loaded speed; 588 gross tons; comp. engs, 2 B&W boilers, 3182 sq ft heating surface; keel Sept4/24.

THE CHARLES WARD ENGINEERING WORKS
Charleston, W. Va.

Purchasing Agent: E. T. Jones.

Lookout, hull 33, towboat, U.S. Engineers, Nashville, Tenn.; 116 ft long; 29 ft beam; 5-6 depth; 2 surface condensing tandem comp engs, 300 HP; 1 watertube boiler; coal burning; induced draft; keel Apr17 24.

Hull 35, maneuver boat, U. S. Engineers, Huntington, W. Va.; 60 ft long; 20 ft beam; 3 ft 4 in depth; keel Sept18 24.

Hull 36, sister to above; keel Sept20/24.

Repairs

COLLINGWOOD SHIPBUILDING COMPANY, LTD.
Collingwood, Ontario

New propeller mounted: Tug Miseford.

NAVY YARD
Bremerton, Wn.

Misc. repairs: Mississippi, Percival, Farragut. Docking and misc. repairs: President Jackson, Decatur. Misc. repairs incld. to opr. as dist. craft: Mahopac, Tatnuck, Swallow, Iroquois, Pawtucket, Sotoyomo.

TODD DRY DOCKS, INC.
Seattle, Wn.

Heavy weather repairs: H. F. Alexander. Dock: Dorothy Luckenbach, Santa Cruz (misc. repairs). Misc. repairs: Redwood, Norwood, Homer, Kulshan, Petroleum 11, President McKinley, Tourist, Tacoma, Vinita, Wheatland Montana, West Notus, Woyo Maru. Dock, clean, paint: Yukon. Alterations: Patterson. Boiler repairs: Ruth Alexander.

New Companies

The John Day Dredging & Power Company, headquarters Portland, Oregon, with an authorized capital stock of $1,000,000 has been incorporated by W. H. Wing, G. P. Newton, and C. O. Boyer.

The Brookdale Steamship Company, with headquarters at Los Angeles, has been incorporated with a capital stock of $75,000; $300 subscribed.

The Bridgehead Shipping Company has been organized at Antioch, California, temporary board of directors comprising: E. J. Viera, president; C. B. Doubias, secretary; Ulrich Diethelm, George Ruckstuhl, Arthur Bigelow, R. Mori, and A. Johnstone.

Pacific Coast Salvage Company, Seattle, has been incorporated with an authorized capital stock of $50,000, by John Turivas, James Fraser, Harmon A. Rulifson.

Grays Harbor Shipping Company, of Aberdeen, Washington, has increased its capital stock from $2500 to $50,000.

Pacific Dredging & Construction Company, Seattle, with an authorized capital stock of $150,000, was incorporated by H. S. Hodgson, W. J. Wilson, and John H. Dirkes.

LUBRICATION ON SHIPBOARD

An Open Forum—Questions on Lubrication Problems Are Invited; They Will Be Answered in Order of Receipt

INSTALLMENT No. 6

This page, Lubrication on Shipboard, prepared through cooperation of Associated Oil Company's staff of lubricating engineers, is attracting favorable mention of many of our readers, and, as will be observed, a number of practical questions are being sent in for solution.

Question No. 27.—I am an oiler on a 5000 horsepower job and I see the chief and first putting white lead into the journals. What does this do toward cooling them down?

Answer.—Marine engineers have always regarded white lead and cylinder oil as a last resort in cooling down large hot journals. The white lead forms a thick film between the surface of the babbitt metal and the shaft and reduces the friction, which will allow the bearings to cool down. After a bearing has been very hot be sure to examine it at the first opportunity, as it is likely to be wiped and the oil grooves plugged up. Also flush out the lead with cylinder oil and follow up with your regular marine engine oil as soon as conditions will allow.

Question No. 28.—What is viscosity and what is its value to an oil? These oil salesmen talk my arm off on viscosity and I want to know something about it so that I can argue back. Is an oil of heavy viscosity more slippery than the light viscosity oil?

Answer.—Viscosity of an oil is a measure of its resistance to flow—that is, its internal friction—and is inversely proportioned to its fluidity. The heavy viscous oil of high viscosity flows slowly and a low viscosity oil is thin and flows easily. Viscosity is subject to atmospheric and operating conditions and as it warms up the viscosity goes down the flow speeds up.

Viscosity is rightly used as a sales talking point because it is the only guide the engineer has to rely upon as a standard of comparison on fluidity or body. However, it is well to remember that viscosity taken at 100 degrees Fahrenheit is not a positive guarantee to lubricating ability at operating temperature ranging up to 350 degrees Fahrenheit in internal combustion engines, because some oil will thin down much more rapidly than others under heat. Other characteristics also enter into consideration, such as fire and flash point, cold test, color, emulsion, etc. The United States government purchases oils on specifications, that is, the oil to be acceptable must conform to certain predetermined tests. The oils are graded as Class A, Class B, and Class C, the last named being the most rigid and including oils for steam turbines, air craft, automobiles, diesel steam cylinders, etc.

As a general thing, high viscosity oils are required for high operating temperatures, great pressure and low speeds, and when machinery is old and in bad condition, low viscosity oil for high speed and light bearing pressure. Viscosity as obtained in the saybolt viscometer is the number of seconds by a stop watch required to fill a graduated glass to the 60-cc mark from the oil supply above, which is brought to 100 degrees Fahrenheit. For steam cylinder and other heavy oils viscosity is taken at 212 degrees Fahrenheit.

A man thoroughly experienced in lubrication should be called upon and held responsible for all recommendations.

Question No. 29.—I was told to mix red engine oil 50-50 with kerosene for crankcase engines. I know that a number of engineers are doing this. And what harmful result can be charged against it?

Answer.—Mixing kerosene with lubricating oil for crankcase engines is certainly not to be recommended. This practice comes from the English merchant marine. It is well for an engineer to keep in mind that oil is cheaper than machinery, and if the very best grade of non-saponifying turbine oil is used in crankcase engines, you will make your trip without a lot of lubricating troubles from your auxiliary machinery, and all the oil you will need will be a little make-up oil from time to time. With the mixture you speak of you will have to clean out your crankcase quite often and throw away the contents, as it is unfit for filteration.

The theory of lubrication is the elimination of friction by the supplying of a film of oil between the moving surfaces. To keep these surfaces apart viscosity or body is required. Kerosene is a cutting agent and it is a grease and oil solvent. With it you cannot lubricate anything aboard ship. By the addition of a good lubricating oil to kerosene, you will certainly build up its value as a lubricant, but by the addition of kerosene to lubricating oil you will just as certainly destroy the value of the oil as a lubricant. I would strongly advise you to stick to good turbine oils and let your repair bills, upkeep, and non-stop record show up for themserves, which will way overbalance the few pennies saved per gallon on the initial fill.

Question No. 30.—Are the air compressors on diesel engines difficult to lubricate?

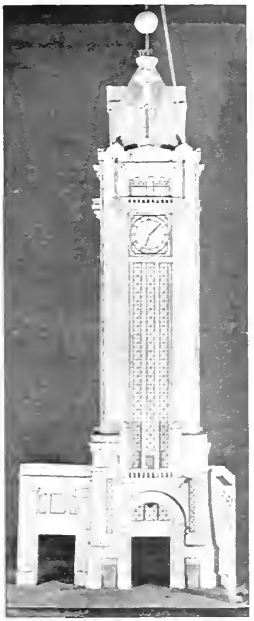
Answer.—Much trouble is reported from various sources on air compressor lubrication for marine diesels, but a great deal of such touble comes from trying to cut down on costs by using inferior oils. There are such a variety of air compressors in use at different pressures, etc., that a general recommendation on oil cannot be made, but a general discussion will be in order. Efficient, satisfactory lubrication of the air compressor is of vital importance. The oils are subjected to extreme heat conditions and come in contact with the air, which tends to oxidize them. Too much lubrication, or poorly refined oils, will form carbon deposits which will cause valve troubles, such as sticking, or particles of hard carbon getting under the seat. In holding discharge valves open, the temperatures in the pipe are raised to cylinder temperatures, which will range as high as 750 degrees Fahrenheit, and explosions will occur, owing to the lubricating oil being vaporized and forming an explosive mixture at these temperatures. Oil should be fed evenly by a mechanical feed lubricator and the intercooler and oil separators should be drained frequently to avoid water and oil being carried over to the last stage cylinder. A straight hydrocarbon oil of about 400 flash and 65 viscosity at 210 degrees Fahrenheit makes a splendid air compressor oil, but each job should have a careful survey and recommendations made for operating conditions.

PERSONAL PARAGRAPHS AND ITEMS OF INTEREST

PACIFIC Coast shipping problems will take an important place on the program of the United States Chamber of Commerce in session at Los Angeles, December 2 and 3. John E. Cushing, traffic manager of the American-Hawaiian Steamship Company, has prepared a survey on the merchant shipping situation and will present his report to the convention. Other prominent Western shipping leaders invited to participate in the program are: Captain Robert Dollar, A. F. Haines, J. P. Williams, Ralph Chandler, H. F. Alexander, W. D. B. Dodson, Charles L. Wheeler, Charles Brown, H. S. Scott, R. D. Pinneo, H. C. Cantelow, H. C. Evens and S. S. Sanberg.

ALOHA TOWER

Here is a model of "Aloha" tower, to be erected at Honolulu, cost $160,000. It will be completed about the middle of 1925, a contract having been let in October by the harbor commissioners. The tower will be 170 feet high, will have a clock face on each of the four sides and will be surmounted by a time ball. There will be several floors, which will house the harbormaster, pilots, customs officials and others.



Aloha Tower, Honolulu's new landmark. The clock and time-ball adorn an impressive edifice.

H. R. Towne

H. R. TOWNE DEAD

Henry Robinson Towne, one of the founders of the Yale & Towne Manufacturing Company, died at his home in New York City on October 15, age 81 years. Mr. Towne came to Stamford, Connecticut, in 1868, to establish a factory for making locks. He had interrupted his technical studies to serve the government during the Civil War and when that was over he again became a student, carrying out his intention to fit himself for the manufacturing business. He lived to see the Stamford factory grow from modest proportions to the world's largest builder of locks and builders' hardware. More than fifty years of his life were devoted to the great firm, whose development was the fruit of his genius, the fulfillment of his faith, and reward of his energy. Even in late years, with the active management given to others, Mr. Towne, as chairman of the board, maintained close touch with the company affairs, never relinquishing his guidance and responsibility. Mr. Towne was a pioneer in many undertakings for the betterment of working conditions and welfare of employes.

TRIBUTE TO GILBERT

Captain C. W. Gilbert, commander of the Pacific Mail intercoastal liner Venezuela, on a recent voyage was presented with a loving cup by members of the Pacific Coast Laundry Owners' Association as a token of appreciation for the comfort and courtesies accorded them on their trip aboard the Venezuela to attend the National Laundry Owners' Association convention at Atlantic City.

Captain C. W. Gilbert

PACIFIC MARINE REVIEW'S
INTERCOASTAL-OFFSHORE-COASTWISE
DIRECTORY
LINES SERVING PACIFIC COAST PORTS

INTERCOASTAL

SAN FRANCISCO

AMERICAN-HAWAIIAN S. S. CO.
J. R. Fitzgerald, agent.
215 Market street. Phone Douglas 9560.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Astoria, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.
(See page 8)

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore and Portland Me.
(See page 14)

DOLLAR STEAMSHIP LINE
The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Garfield 4300.
PASSENGERS AND FREIGHT.
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Los Angeles and San Francisco.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between San Francisco, Seattle, Vancouver, B. C., Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.
(See page 10)

GARLAND STEAMSHIP CORP.
General Steamship Corp., agents.
240 Battery street. Phone Kearny 410.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between San Francisco, Seattle, and Los Angeles and Norfolk, Baltimore, and Philadelphia.

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
(See page 14)
SAILING—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
201 California street. Phone Douglas 7600.
FREIGHT ONLY.
SAILINGS—North Atlantic - Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles, to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 21 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.
(See page 12)

MUNSON-McCORMICK LINE
McCormick Steamship Co., Pacific Coast agts.
215 Market street. Phone Kearny 5100.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma, monthly to Jacksonville, Fla.
(See page 8)

PACIFIC MAIL STEAMSHIP CO.
508 California street. Phone Sutter 3800.
SAILINGS—Passengers and Freight.
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Baltimore, Norfolk, Cristobal, Balboa, Corinto, La Libertad, San Jose de Guatemala, Manzanillo, Los Angeles, and San Francisco.
SAILINGS—Direct Freight Service.
Every 7 days. Eastward calls: San Francisco, Los Angeles. Westward: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle.
(See page 10)

PACIFIC-CARRIBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
430 Sansome street. Phone Kearny 2600.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.
(See page 17)

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Passenger Offices: 460 Market street. Phone Douglas 8060.
Freight and Operating Offices: Pacific Steamship Co., 60 California St. Phone Sutter 7800.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.
(See page 12 for sailing schedule)

TRANSMARINE LINES
W. D. Benson, Pac. Coast Mgr.
311 California street. Phone Garfield 6760.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED-AMERICAN LINES, INC.
Sudden & Christensen, Pacific Coast Agents.
210 California street. Phone Garfield 2846.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle

WILLIAMS LINE
Williams Steamship Company, Inc.
A. F. Zipf, Pacific Coast manager.
110 California street. Phone Douglas 1670.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Tacoma, Seattle, Portland, Astoria, San Francisco, Oakland, Los Angeles, San Diego and New York, Philadelphia, Norfolk and Baltimore.

SEATTLE

AMERICAN-HAWAIIAN S. S. CO.
Henry Death, res. agent.
Merrill Lee Building.
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Port
[illegible]
SAILINGS—Every 21
[illegible]
See page 8

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.

S. F. MARINE EXCHANGE

With the taking over of the marine exchange, the San Francisco Chamber of Commerce now has one of the most complete marine intelligence departments in the world. Dating back to the days when there was neither radio nor telegraph and when all information was conveyed by messengers on horseback, the transmission of marine information has developed into a well organized and systematic function.

What is now the marine department of the Chamber was inaugurated in 1849 by Sweeny & Baugh. In 1867 it was acquired by the old Merchants Exchange Association, which conducted it until 1901, when the property was purchased by the present Merchants Exchange. It was conducted by the Merchants Exchange until 1911, when it was merged with the Chamber of Commerce.

Included as part of the marine department was the marine exchange. Up to September 30, 1914, the Chamber operated the only marine exchange in San Francisco. On October 1, 1914, the stations of Point Lobos and Meiggs Wharf were closed by the Chamber of Commerce and immediately taken over by the San Francisco Examiner, which conducted this service until recently, when it was again taken over by the Chamber of Commerce.

Consolidation of this service with the marine department has met with great favor in the shipping world, according to Abe Marks, manager of the department.

Other features of the department include: Blackboard steamer postings; weather reports; tide reports; rain reports; hydrographic reports; coast soundings; stock and bond quotations; coffee, cotton and silver quotations; rates of exchange; wireless communications from ships; postings of marine mishaps; postings of ship charters; and numerous other things. The department is open day and night for the benefit of the shipping world.

INTERCOASTAL

SAILINGS—Every 10 days between Seattle, Portland, San Francisco and Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
(See page 14)

DOLLAR STEAMSHIP LINE

Admiral Oriental Line, agent.
420 L. C. Smith Building. Phone Elliott 0974.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Vancouver, Seattle, San Francisco, Los Angeles and Philadelphia, New York, Boston, Portland, Me., Baltimore and Norfolk
(See page 10)

GARLAND STEAMSHIP CORP.

General Steamship Corporation, agents.
Colman Building. Phone Elliott 3706.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Seattle, San Francisco, Los Angeles and Norfolk, Baltimore, and Philadelphia.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.
(Page 14)

LUCKENBACH LINES

Luckenbach Steamship Company, Inc.
L. C. Smith Building. Phone Elliott 1206.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf.
Every 21 days from Seattle, Tacoma, Vancouver, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.
(See page 12)

MUNSON-McCORMICK LINE

Pier 6. Phone Elliott 5367.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco, Portland, Tacoma and Seattle; monthly to Jacksonville, Fla.
(See page 8)

PACIFIC-CARIBBEAN GULF LINE

Swayne & Hoyt, Inc., managers.
Lobby 4 Central. Phone Elliott 6393.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.
(See page 17)

PANAMA PACIFIC LINE

International Mercantile Marine Company.
Passenger Office, 619 Second avenue.
Pacific Steamship Company, agents.
L. C. Smith Building. Phone Elliott 2068.
SAILINGS—Intercoastal.
Regular intervals between New York, San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.
(See page 12 for sailing schedule)

TRANSMARINE LINES

Transmarine Corporation.
4421 White Building. Phone Elliott 6127.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Port Newark and Los Angeles, San Francisco and Oakland.

UNITED-AMERICAN LINES, INC.

Sudden & Christenson, agents.
Arctic Club Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE

Williams Steamship Company, Inc.
Spokane street terminal. Phone Elliott 6657.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, and New York, Philadelphia, Norfolk and Baltimore.

LOS ANGELES

AMERICAN-HAWAIIAN S. S. CO.

F. A. Hooper, agent.
Transportation Bldg. Phone [illegible]
FREIGHT ONLY.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Astoria, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Astoria, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.
(See page 8)

ARGONAUT STEAMSHIP LINE

Norton, Lilly & Company, general agents.
625 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks from Vancouver, Seattle, Portland, San Francisco and Los Angeles to New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
(See page 14)

DOLLAR STEAMSHIP LINE

212 Mortgage Guarantee Bldg., 626 So. Spring St. Phone 874-891.
PASSENGERS AND FREIGHT
SAILINGS—Intercoastal.
Fortnightly sailings from Boston and New York to Los Angeles and San Francisco
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Sailings between Los Angeles, San Francisco, Seattle, Vancouver, B. C., New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.
(See page 10)

GARLAND STEAMSHIP CORP.

General Steamship Corporation, agents.
541 South Spring street.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Seattle, San Francisco and Los Angeles and Norfolk, Baltimore and Philadelphia.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company, general agents.
638 Van Nuys Bldg. Phone TRinity 3044.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.
(See page 14)

LUCKENBACH LINES

Luckenbach Steamship Company.
208 West Eighth street. Phone Main 808.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 21 days from Vancouver, Seattle, Tacoma, Portland, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.
(12)

MUNSON-McCORMICK LINE

McCormick Steamship Company.
Lane Mortgage Bldg. Phone Metropolitan 6140.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma; monthly to Jacksonville, Fla.
(See page 8)

PACIFIC MAIL STEAMSHIP CO.

Passenger Offices: 548 South Spring street.
Freight Office: 604 West Sixth street.
SAILINGS—Passengers and Freight.
Every 23 days from San Francisco and Los Angeles via Manzanillo, San Jose de Guatemala, Acajutla, La Libertad, Corinto, Balboa, Cristobal, Havana, Baltimore and New York. Westward calls: New York, Baltimore, Norfolk, Newport News, Charleston, Jacksonville, Los Angeles, San Francisco, Honolulu, Yokohama, Kobe, Shanghai, Manila.
SAILINGS—Direct Freight Service.
Every 7 days. Eastward calls: San Francisco, Seattle, Westbound calls: New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland and Seattle
(See page 10 for sailing schedule)

PACIFIC-CARIBBEAN GULF LINE

Swayne & Hoyt, Inc., managers.
[illegible]
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.
(See page 17)

PANAMA PACIFIC LINE

International Mercantile Marine Company.
Freight Office: Pacific Steamship Company,

UNITED AMERICAN

San Francisco passenger headquarters of the United American Line are now at 574 Market street, opposite Second street. Theo. H. Jacobs, Pacific Coast passenger manager, in his new location has secured one of the most convenient sites in the territory. Soon as he gets settled we'll have to go over and take a good picture of the new "U. A. L." office.

HOFFMAN DEAD

Captain John C. Hoffman, resident of Benicia for forty years, passed away last month at his home, aged 68. He had long service with the Southern Pacific Company and was retired in 1915 as captain of the ferries Solano and Contra Costa.

McCORMICK OFFICE

McCormick Steamship Company has opened a San Francisco passenger ticket office at 661 Market street, in the Palace Hotel building. This will be the main ticket office, but tickets will also be available over the line at the other sub-agencies of the company throughout the district. The new office has been especially fitted up and will be one of the most conveniently located passenger headquarters in the district.

COAST LUMBER

An order for 1,500,000 feet of ties for the Sudan in Africa has been placed with small mills in British Columbia for January-February delivery. Great Britain has been seeking to place an order for 30,000,000 feet of ties and it is now reported fixed. British Columbia mills were able to take 9,000,000 feet and the remainder was placed with United States mills.

OPENS OFFICE

Captain Cecil Brown, formerly chief surveyor for the underwriters in San Francisco, has opened offices in the Robert Dollar Building, 311 California street, where he will carry on the business of marine surveyor.

JOINS TOWING FIRM

O. W. Helwig is now secretary and treasurer of the Pioneer Towing Company of Seattle. Mr. Helwig recently purchased the interest of Captain Frank E. Joris. The Pioneer Towing Company is now owned by George R. Osborn, A. J. Cooper, and O. W. Helwig. The firm is one of the oldest towing organizations of Puget Sound.

INTERCOASTAL

322 Citizens National Bank.
Passenger Offices: 510 So. Spring st. Phone 827-511.
SAILINGS—Intercoastal.
Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.
(See page 12 for sailing schedule)

TRANSMARINE LINES
(Transmarine Corporation.)
G. J. Darragh, agent.
A. G. Bartlett Bldg. Phone Broadway 2580-2581.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Weekly between Fort Newark and Los Angeles, San Francisco and Oakland.

UNITED AMERICAN LINES, INC.
Los Angeles Steamship Company, agents.
407 Central Building.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

WILLIAMS LINE
Williams Steamship Company.
Stock Exchange Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Twice monthly between Seattle, Tacoma, San Francisco, Oakland, Los Angeles, San Diego, and New York, Philadelphia, Norfolk and Baltimore.

PORTLAND

AMERICAN-HAWAIIAN S. S. CO.
C. D. Kennedy, agent.
Railway Exchange Building.
SAILINGS—Weekly from Seattle, Tacoma, Portland, Astoria, Oakland, San Francisco, Los Angeles to New York, Philadelphia and Boston.
SAILINGS—Every 21 days from Portland, Astoria, Seattle, Tacoma, Oakland, San Francisco, Los Angeles to Charleston.
(See page 8)

ARGONAUT STEAMSHIP LINE
Norton, Lilly & Company, general agents.
400 Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Providence, Philadelphia, Baltimore and Portland, Me.
(See page 14)

ISTHMIAN STEAMSHIP LINES
Norton, Lilly & Company, general agents.
Yeon Building. Phone Atwater 2661.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Dido and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.
(See page 14)

LUCKENBACH LINES
Luckenbach Steamship Company, Inc.
Spalding Building. Phone Broadway 4378.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Philadelphia, New York and Boston.
SAILINGS—Gulf Service.
Every 21 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland and Los Angeles to Galveston, New Orleans and Mobile.
(See page 12)

MUNSON-McCORMICK LINE
McCormick Steamship Company.
181 Sansome street. Phone Broadway 1498.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York and Baltimore and Los Angeles, San Francisco, Portland and Seattle; monthly to Jacksonville, Fla.
(See page 8)

PACIFIC MAIL STEAMSHIP CO.
Norton, Lilly & Co., agents.
Yeon Building.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 7 days. Eastward calls: San Francisco, Los Angeles. Westbound New York, Philadelphia, Baltimore, Norfolk, Los Angeles, San Francisco, Portland, and Seattle
(See page 10)

PACIFIC-CARIBBEAN GULF LINE
Swayne & Hoyt, Inc., managers.
1008 Spalding Building.
FREIGHT ONLY.
SAILINGS—Monthly from Seattle and Puget Sound, Portland and Columbia River, San Francisco, and Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports as inducements offer, via Panama Canal.
(See page 17)

PANAMA PACIFIC LINE
International Mercantile Marine Company.
Pacific Steamship Company, freight agents.
Admiral Line Terminal.
SAILINGS—Regular intervals between New York and San Diego, Los Angeles, San Francisco, Oakland, Portland, Seattle and Tacoma.
(See page 12 for sailing schedule)

UNITED AMERICAN LINES, INC.
Columbia-Pacific Shipping Company, agents.
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Weekly between New York, Baltimore, Savannah and Los Angeles, San Francisco, Oakland, Portland and Seattle.

VANCOUVER

ARGONAUT STEAMSHIP LINE
B. W. Greer & Son, Ltd.
602 Hastings St., West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Every 2 weeks between Vancouver, Seattle, Portland, San Francisco, Los Angeles and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
(See page 14)

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.
B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Every 30 days, Vancouver to Hawaii. Through bills of lading from other Pacific Coast ports.

DOLLAR STEAMSHIP LINE
Canadian Robert Dollar Co., Ltd.
402 Pender street, West. Phone Seymour 8680.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Regular sailings between Vancouver, B. C., Seattle, San Francisco, Los Angeles, New York, Boston, Baltimore, Philadelphia, Norfolk, and Portland, Me.
(See page 10)

ISTHMIAN STEAMSHIP LINES
B. W. Greer & Son, Ltd.
602 Hastings street, West. Phone Seymour 2377.
FREIGHT ONLY.
SAILINGS—Intercoastal Service.
Every 5 to 7 days between Vancouver, Seattle, San Francisco, Los Angeles, San Diego and New York, Boston, Providence, Philadelphia, Baltimore and Portland, Me.
SAILINGS—Hawaiian Service.
Monthly from Baltimore to Hawaii via San Diego and Los Angeles; also direct to Hawaii from Philadelphia, New York and Boston.
(See page 14)

LUCKENBACH LINES
Empire Shipping Company, Ltd.
Phone Seymour 8014.
FREIGHT ONLY.
SAILINGS—North Atlantic-Intercoastal.
Every 7 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Philadelphia, New York and Boston
SAILINGS—Gulf.
Every 21 days from Vancouver, Seattle, Tacoma, Portland, Astoria, San Francisco, Oakland, and Los Angeles to Galveston, New Orleans, and Mobile.
(See page 12)

MUNSON-McCORMICK LINE
King-lev Navigation Company, Ltd.
602 Pacific Building. Phone Seymour 9506.
FREIGHT ONLY.
SAILINGS—Intercoastal.
Semi-monthly between New York, Baltimore, San Diego, Los Angeles, San Francisco and North Pacific Coast ports.
(See page 8)

PACIFIC-CARIBBEAN GULF LINE
[illegible]
413 Pacific Building
FREIGHT ONLY.
SAILINGS—Monthly from North Pacific ports, San Francisco, Los Angeles to New Orleans, Mobile and Caribbean Sea and Gulf of Mexico ports.
See page 17)

MORAN RETURNS

A. A. Moran, traffic manager of the Dollar Steamship Line, following two months on the Atlantic Coast, has returned to the home office of the line in San Francisco. While away Mr. Moran attended the joint conference of the Far Eastern and Pacific Westbound bodies at Montreal. In Washington he conferred with the Navy Department on the establishment of the Dollar Steamship Line's freight service from San Francisco to Guam and Cavite. This new service is to be inaugurated with the sailing of the steamer Stuart Dollar from San Francisco on December 10.

TRANSMARINE

W. D. Benson, Pacific Coast manager of the Transmarine Corporation, headquarters San Francisco, announces that the Transmarine fleet intercoastal service will resume a weekly schedule out of Pacific Coast ports to the Atlantic Coast with the addition of two fast freighters. For several months the "T" Line has afforded sailings every 10 and 12 days. Increasing westbound cargoes have brought about the improvement of the service.

CALLING MANILA

Vessels of the Transatlantic Steamship Company of Gothenberg, operated by the General Steamship Corporation between North Pacific ports and Australia, will return to the Pacific Coast via Manila, it is announced by Harry Scott, president of the General.

FROM MAZATLAN

William Towning, general agent of the Mexican States Line at Mazatlan, recently arrived in San Francisco aboard the steamer Guerrero to confer with the officials of Williams, Dimond & Company, representatives of the line.

ROSE CITY

Officials of the McCormick Steamship Company at San Francisco recently held an inspection of the steamer Rose City, purchased for its Pacific coastwise fleet. One hundred and fifty shipping executives visited the popular liner, attending luncheon as the guests of Captain T. J. Mageen, master of the vessel. Charles R. McCormick, president of the line, and Charles L. Wheeler, vice-president and general manager, assisted in the reception of the guests.

ORIENTAL

SAN FRANCISCO

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

Dodwell & Company, Ltd., agents.
2 Pine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.

DOLLAR STEAMSHIP LINE

The Robert Dollar Co.
Robert Dollar Building, 311 California street. Phone Garfield 4300.
PASSENGERS AND FREIGHT
SAILINGSTrans-Pacific.
Fortnightly from San Francisco to Honolulu, Kobe, Shanghai, Hongkong, Manila and Singapore.
FREIGHT ONLY.
SAILINGS—Regular sailings between San Francisco and Yokohama, Kobe, Shanghai, Hongkong, Manila, Singapore, Sourabaya, Samarang, and Batavia.
Guam Service—Regular sailings between San Francisco, Pearl Harbor, Hawaii, Guam, Cavite (Manila).
(See page 10)

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
Merchants Exchange Bldg. Phone Sutter 3414
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.
(See page 12)

NIPPON YUSEN KAISHA

Dodwell & Company, Ltd., agents.
2 Pine street. Phone Sutter 4201.
FREIGHT ONLY.
SAILINGS—Regular service between China, Japan ports and United States Atlantic ports via Panama Canal, vessels calling at San Francisco on both outward and homeward voyages. One arrival monthly from Japan, discharging cargo at San Francisco. One to two sailings monthly homeward, occasionally loading cargo for Yokohama, Kobe and Shanghai.

OSAKA SHOSEN KAISHA

McCormick, McPherson & Lapham.
703 Market street. Phone Kearny 2633.
SAILINGS—San Francisco Service (FREIGHT ONLY).
Monthly service to and from Yokohama, Kobe, Moji, Shanghai, Hongkong and Singapore.
SAILINGS—Los Angeles Service (PASSENGERS AND FREIGHT).
A steamer a month to Kobe, Yokohama, Yokkaichi, Nagasaki, Hongkong, Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, the Panama Canal and Los Angeles.

CALIFORNIA ORIENT LINE

Pacific Mail Steamship Co., managing operators.
508 California street. Phone Sutter 3800.
Operating U. S. S. B. vessels.
PASSENGERS AND FREIGHT.
SAILINGS—Trans-Pacific Service.
Every 14 days from San Francisco to Honolulu, Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—Hongkong-India (Freight Only.)
Connection at Hongkong every 2 weeks for India ports.
(See page 16 for sailing schedule)

ROOSEVELT-KOKUSAI LINE

General Steamship Corporation, agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—At frequent intervals from San Francisco and Los Angeles to Yokohama, Kobe, Shanghai, Hongkong and other Oriental ports.

STRUTHERS & BARRY

(Operating U. S. S. B. vessels)
112 Market street. Phone Sutter 7640.
FREIGHT ONLY.
SAILINGS—Trans-Pacific.
Regular intervals from Los Angeles, San San Francisco, thence direct to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Dairen, Taku Bar and Saigon if inducements offer.
(See page 17)

TOYO KISEN KAISHA

(Oriental Steamship Company.)
549-51 Market street. Phone Sutter 3900.
PASSENGERS AND FREIGHT.
SAILINGS—Twice a month between San Francisco, Honolulu, Yokohama, Kobe, Nagasaki, Shanghai and Hongkong.
SAILINGS—Monthly to China and Japan on steamers from the West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental-New York via Panama Canal.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
222 Robert Dollar Bldg. Phone Garfield 3899.
FREIGHT ONLY.
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

SEATTLE

ADMIRAL ORIENTAL LINE

L. C. Smith Building. Phone Elliott 2068.
SAILINGS—PASSENGERS AND FREIGHT.
Every 12 days between Seattle, Victoria, B. C., Yokohama, Kobe, Shanghai, Hongkong and Manila.
SAILINGS—FREIGHT ONLY.
Regular service to Vladivostok, Dairen, Tientsin, Taku Bar, Tsingtao, Shanghai and Japan ports on either outward or homeward voyages, as freight offers justify direct call.
SAILINGS—Monthly service to Yokohama, Kobe, Shanghai, Foochow, Amoy, Swatow, Manila Cebu and Iloilo.
(See page 16)

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Stuart Building. Phone Elliott 0147.
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria and Seattle to Yokohama, Kobe, Hongkong and Manila.

R. T. JOHNS & COMPANY

R. T. Johns & Company, agents.
Central Building. Phone Elliott 7697.
FREIGHT ONLY.
SAILINGS—Tramp service between Seattle and Oriental ports of Yokohama, Kobe, Nagoya, Shimidzu and Moji.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
Smith Tower Building. Phone Elliott 1450.
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco, Portland, Seattle and Puget Sound ports, thence to China and Japan.
(See page 12)

NIPPON YUSEN KAISHA

Colman Building. Phone Elliott 3514.
PASSENGERS AND FREIGHT.
SAILINGS—Frequent intervals, calling at Victoria, B. C., Vancouver, B. C., Yokomama, Kobe, Nagasaki, Shanghai, Hongkong or other Oriental ports as inducements offer.

OSAKA SHOSEN KAISHA

W. C. Dawson & Company, agents.
Mutual Life Building. Phone Elliott 0842.
PASSENGERS AND FREIGHT.
SAILINGS—Regular two months service to Yokohama, Kobe, Moji, Dairen, Shanghai, Hongkong and Hongkong.

SUZUKI & COMPANY

Colman Building. Phone Main 7220.
FREIGHT ONLY.
SAILINGS—Irregular service between Seattle and Japanese ports.

THORNDYKE SHIPPING CO.

L. C. Smith Building. Phone Main 3168.
FREIGHT ONLY.
SAILINGS—Regular service between Puget Sound, Grays Harbor, Vancouver and Victoria, Kobe, Osaka and Nagoya.

WALKER-ROSS, INC.

L. C. Smith Building. Phone Elliott 1274.
FREIGHT ONLY.
SAILINGS—Regular service between Seattle and Yokohama, Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company, Inc., agents.
Coast Guard Building.
FREIGHT ONLY.
SAILINGS—Every 2 weeks from Seattle to Yokohama, Kobe, Osaka and Nagoya.

LOS ANGELES

CANADIAN GOVERNMENT MERCHANT MARINE

Dodwell & Co., Ltd., agents.
412 Henne Building. Phone Broadway 7[illegible]

DAN HANLON PASSES

Daniel J. Hanlon, president of the Hanlon Drydock & Shipbuilding Company, passed away November 5 at his home in Oakland, California. Born in Ireland 56 years ago, Mr. Hanlon came to the United States when a child and early moved to California. He founded and developed the well-known shipyard on the Oakland estuary which bears his name. During the World War the Hanlon yards took an active part in the shipbuilding program. One of Mr. Hanlon's latest efforts was the development and construction of the Hanlon type of lumber carrier, especially designed for the requirements of the Pacific Coast lumber trade. He also produced the Hanlon winch for the handling of lumber cargo. At the time of his death Mr. Hanlon owned the steamers Dan S. Hanlon and the Bertie M. Hanlon. These ships are operated by W. R. Chamberlain & Company of San Francisco. He is survived by his widow, Mrs. Bertie Hanlon, and a daughter, Miss Marie Hanlon, both of Oakland.

U. S. S. B. CHANGES

James G. Tompkins, manager, traffic department, Emergency Fleet Corporation, at Savannah, Georgia, has been transferred to Washington as assistant manager of the European and Mediterranean Trades Division. He is succeeded at Savannah by George C. Payne, transferred from assistant manager of the Far East and Long Voyage Trades Division at New York.

JAHNCKE HONORED

Ernest Lee Jahncke, president of the Jahncke Dry Docks, Inc., New Orleans, was recently elected vice-president of the Atlantic Coast Shipbuilders' Association. Mr. Jahncke will act for the association in further enlisting the support of the marine interests in the Southern States in the work of the organization.

PORT PROGRESS

At Corpus Christi, Texas, work is progressing on the new deep water port being built under government supervision. Concrete foundations on forty-foot piling have been completed for transfer sheds and warehouses, and piling is being driven for wharves and mooring clusters. Levies are in progress of construction and dredging the channel and turning basin will begin soon. The sum of $4,320,000 will be spent on this improvement. Work is expected to be complete in two years.

ORIENTAL

and Vandike 4944.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China, ports, returning via Los Angeles and San Francisco.

DOLLAR STEAMSHIP LINE

212 Mortgage Guarantee Bldg. Phone 874 891.
PASSENGERS AND FREIGHT
SAILINGS—Fortnightly from Los Angeles and San Francisco to Honolulu, Kobe, Shanghai, Hongkong, Manila and Singapore.
FREIGHT ONLY.
SAILINGS—Trans-Pacific Service.
Regular sailings between Los Angeles, San Francisco, and Yokohama, Kobe, Shanghai, Hongkong, Manila, Singapore, Sourabaya, Samarang, and Batavia.
(See page 10)

OSAKA SHOSEN KAISHA

McCormick, McPherson & Lapham, agents.
Transportation Bldg. Phone VAndike 6171.
PASSENGERS AND FREIGHT.
SAILINGS—A steamer a month to Yobe, Yokohama, Yokkaichi, Nagasaki, Hongkong Saigon, Singapore, Colombo, Durban and Cape Town. These vessels are operating in round-the-world service and on their homebound trip call at Santos, Buenos Aires, Rio de Janeiro, New Orleans, Panama Canal and Los Angeles.

ROOSEVELT-KOKUSAI LINE

General Steamship Corporation, agents.
543 So. Spring street.
FREIGHT ONLY.
SAILINGS—At frequent intervals from San Francisco and Los Angeles to Yokohama, Kobe, Shanghai, Hongkong and other Oriental ports.

STRUTTERS & BARRY

(Operating U. S. S. B. vessels.)
701-02 Transportation Bldg. Phone Tucker 5969.
FREIGHT ONLY.
SAILINGS—Regular intervals from Los Angeles and San Francisco, thence to Yokohama, Kobe, Shanghai, Hongkong, Manila and Singapore. Also calls at Dairen, Taku Bar and Saigon if inducements offer.
(See page 17)

TOYO KISEN KAISHA

(Oriental Steamship Company.)
S. L. Kreider, agent
375 Pacific Electric Bldg. Phone TRinity 6556.
PASSENGERS AND FREIGHT.
SAILINGS—Regular to China and Japan via San Francisco on steamers of Japan, Hongkong, San Francisco line.
SAILINGS—Monthly to Oriental ports via San Francisco on steamers from West Coast of Mexico and South America.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental New York via Panama Canal.

PORTLAND

AMERICAN ORIENTAL SERVICE

A. M. Gillespie, Inc., agent
Board of Trade Bldg. Phone Broadway 4348.
SAILINGS—Monthly to ports of Japan and China as inducements offer.

MITSUI & COMPANY, LTD.

(Mitsui Bussan Kaisha, Ltd.)
702 Wilcox Building. Phone Main 4113
FREIGHT ONLY.
SAILINGS—Monthly from San Francisco to Portland and North Pacific ports, thence to China and Japan.
(See page 12)

OREGON ORIENTAL LINE

(Operating U. S. S. B. vessels.)
Columbia Pacific Shipping Company
Porter Building. Phone Bdwy. 5360.
FREIGHT ONLY.
SAILINGS—Every 3 weeks from Portland to Orient calling at Yokohama, Kobe, Shanghai, Taku Bar and Dairen.
Every two weeks from Portland to Yokohama, Kobe, Hongkong and Manila.
(See page 17)

PORTLAND-ORIENT LINE

Wallem & Company, agents.
Porter Building. Phone Broadway 1344
SAILINGS—From Portland to Yokohama, Kobe, Shanghai, Tsingtao, Taku Bar, Dairen, Vladivostok.

TOYO KISEN KAISHA

(Oriental Steamship Company.)
Oregon-Pacific Company, agents.
203-4 Wilcox Building. Phone Bdwy. 4529.
FREIGHT ONLY.
SAILINGS—Monthly from Portland to Oriental ports.
SAILINGS—FREIGHT ONLY.
Regular sailings in round-the-world service and Oriental New York via Panama Canal.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Company.
1109 Porter Building.
FREIGHT ONLY
SAILINGS—Semi-monthly from Puget Sound and Portland to Yokohama and Kobe and irregular service from China and Japan ports to San Francisco, Portland and Seattle.

VANCOUVER

BLUE FUNNEL LINE, LTD.

Dodwell & Co., Ltd., agents.
Yorkshire Building. Phone Seymour 9376
PASSENGERS AND FREIGHT.
SAILINGS—Every 21 days from Vancouver, Victoria, and Seattle to Yokohama, Kobe, Hongkong, and Manila.

CANADIAN GOVERNMENT MERCHANT MARINE, LTD.

B. C. Keely, Pacific Coast manager.
Phone Seymour 8420.
FREIGHT ONLY.
SAILINGS—Oriental Service.
Monthly from Vancouver to Yokohama, Kobe, Shanghai, North China ports, returning via Los Angeles and San Francisco.

CANADIAN PACIFIC STEAMSHIPS, LTD.

Canadian Pacific Railway Station. Phone Seymour 2630.
PASSENGERS AND FREIGHT.
SAILINGS—Every 14 days from Vancouver to Japanese ports, Shanghai, Hongkong, and Manila.

NIPPON YUSEN KAISHA

B. W. Greer & Son, Ltd.
602 Hastings street, West Phone Seymour 2377.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service between Vancouver and ports in Japan, China and Philippines.

OSAKA SHOSEN KAISHA

Empire Shipping Company, Ltd.
815 Hastings St., W. Phone Seymour 8014
8014.
PASSENGERS AND FREIGHT.
SAILINGS—Every 2 weeks to all ports in Japan and China, also Vladivostok, Singapore, Bombay, etc.

SUZUKI & COMPANY

B. L. Johnson Walton & Company
837 Hastings Street, W. Phone Seymour 7[illegible]
FREIGHT ONLY.
SAILINGS—Irregular service between Pacific Coast ports and Japan ports.

WALKER-ROSS, INC.

Canadian American Shipping Company, Ltd.
Phone Seymour 2198.
FREIGHT ONLY.
SAILINGS—Regular service to Yokohama Kobe, Osaka and Nagoya.

YAMASHITA KISEN KOGYO KAISHA

Yamashita Co., Inc.
Merchants Exchange Building
FREIGHT ONLY.
SAILINGS—Every 2 weeks to Yokohama Kobe, Osaka and Nagoya.

UNITED KINGDOM---CONTINENTAL EUROPE

SAN FRANCISCO

BLUE FUNNEL LINE

Ocean Steamship Company and China Mutual Steam Navigation Company, Ltd.
3 Fine street. Phone Sutter 4201.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

BLUE STAR LINE

The Robert Dollar Co.
311 California Street. Phone Sutter 6[illegible]
REFRIGERATOR AND GENERAL CARGO
SAILINGS—From San Francisco, Los Angeles, Portland, Seattle, Vancouver, B. C., Victoria, B. C., to London, Liverpool, Glasgow, Belfast, Havre, Antwerp, Rotterdam, Hamburg, Bremen, Copenhagen, Gothenburg, Stockholm, Helsingfors, Leningrad.
See page 10.

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.
433 California street. Phone Sutter 6717
PASSENGERS AND FREIGHT.

McCORMICK LINE

Robert W. Heinsch has been appointed general freight agent for the McCormick Steamship Company at Seattle.

OLD-TIMER DIES

Captain George W. Gove, veteran master mariner of Puget Sound, died recently at Seattle. He was 86 years old. Captain Gove came around the Horn to California in 1864 as mate of the full-rigged ship Coromondel, and for a number of years sailed out of San Francisco in the China trade as master of the bark Samosett.

PUBLICITY HEAD

C. H. Tallant has been appointed to handle the advertising for the Drake Lock-Nut Manufacturing Company, manufacturers of the Drake lock-nut, which has been standardized on numerous machines and engines. This company is bringing out a new furniture glider which was recently placed on the market.

DOLLAR LINE

Charles A. Perkes, assistant traffic manager of the Dollar Steamship Line at Shanghai, recently reached San Francisco to begin a tour of America. He will then continue on the route of the Dollar round-the-world service. He is visiting the Dollar agencies throughout the globe.

NEW FREIGHT AGENT

R. M. Grose has been appointed general agent for the Los Angeles Steamship Company at San Francisco, succeeding W. K. Sempey, who will devote all his time to the business of general agent of the company's operating department, according to an announcement from the office of P. F. Finnegan, freight traffic manager. The change was effective November 1.

TRAVEL TRAFFIC

Walter A. Ramage, San Francisco district passenger agent for the Oceanic Steamship Company, announces an improvement in travel between San Francisco and Australia. The Oceanic liner Sierra, Captain J. H. Trask, on her recent departure carried 175 passengers one of the heaviest lists in recent months. In addition the liner carried a capacity cargo. Mr. Ramage predicts that the improved travel condition will sustain for some months.

UNITED KINGDOM---CONTINENTAL EUROPE

SAILINGS—Regular service, Pacific Coast ports, direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.
(See page 10)

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Service between Vancouver, Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports, via Hull.
(See page 14)

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation, sub-agents.
240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

Furness, Withy & Company, Ltd.
Furness (Pacific), Ltd.
710 Balfour Building. Phone Sutter 6478-6479.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports when inducements offer.
(See page 18)

GENERAL STEAMSHIP CORP.

240 Battery street. Phone Kearny 4100.
FREIGHT ONLY.
SAILINGS—Regular service from Pacific Coast ports to London, Hull and Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
351 California street. Phone Sutter 6427.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings fortnightly.

ISTHMIAN STEAMSHIP LINES

E. C. Evans & Sons, agents.
260 California street. Phone Douglas 8040-1-2.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.
(See page 14)

JOHNSON LINE

W. R. Grace & Co., general agents.
332 Pine street. Phone Sutter 3700.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenberg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint service of the Royal Mail Steam Packet Company and Holland America Line.)
401 Market street. Phone Douglas 7310.
PASSENGERS AND FREIGHT.
SAILINGS—Every 4 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.
(See page 18)

NORWAY PACIFIC LINE

485 California street. Phone Sutter 5099.
FREIGHT ONLY.
SAILINGS—From San Francisco and Los Angeles to United Kingdom, Continental ports and Scandinavia. Sailings every 30 days.

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
230 California street. Phone Sutter 3600.
FREIGHT ONLY.
SAILINGS—Service from Seattle, Portland, San Francisco and Los Angeles to Marseilles and Genoa as inducements offer.
(See page 14)

UNITED AMERICAN LINES, INC.

Sudden & Christenson, Pacific Coast Agents.
230 California street. Phone Garfield 2846.
For passengers, Phone Sutter 8.
PASSENGERS AND FREIGHT.
SAILINGS—North Pacific-European Service. Fortnightly between North Pacific ports and ports in United Kingdom and Continental Europe.

SEATTLE

BLUE FUNNEL LINE

Dodwell & Company, Ltd., agents.
Stuart Building. Phone Elliott 9147.
PASSENGERS AND FREIGHT.
SAILINGS—Every 6 weeks from North Pacific ports, San Francisco and Los Angeles to London, Liverpool and Glasgow.

BLUE STAR LINE

Admiral Oriental Line, agents.
L. C. Smith Bldg. Phone Elliott 1924.
REFRIGERATOR AND GENERAL CARGO.
SAILINGS—Every 21 days from Vancouver, Seattle, Portland, San Francisco to Glasgow, Liverpool, Southampton, and London.
(See page 16)

EAST ASIATIC COMPANY, LTD.

The East Asiatic Company, Inc., agents.
823 Alaska Building. Phone Elliott 9104.
PASSENGERS AND FREIGHT.
SAILINGS—Regular service, Pacific Coast ports direct to Hamburg, Hull, Gothenburg, Copenhagen, with trans-shipment to all Scandinavian and Baltic ports.
(See page 10)

ELLERMAN & BUCKNALL STEAMSHIP CO., LTD.

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Service between Puget Sound, Portland, San Francisco, Los Angeles, San Diego and Havre, London, Hull and other United Kingdom and Continental ports as inducements offer. Through bills of lading issued to Scandinavian, Baltic, Portuguese, Spanish, Mediterranean and Levant ports via Hull.
(See page 14)

FRENCH LINE

(Compagnie Generale Transatlantique.)
General Steamship Corporation, agents.
Colman Building. Phone Elliott 5706.
FREIGHT ONLY.
SAILINGS—Twice a month from Vancouver, Seattle, Portland, San Francisco, Los Angeles to French and other Continental and United Kingdom ports via Panama Canal and West Indies.

FURNESS LINE

(Furness, Withy & Company Ltd.)
Furness (Pacific), Ltd.
Burchard Cooke, agents. 705 Arctic Bldg.
PASSENGERS AND FREIGHT.
SAILINGS—Fortnightly from Seattle, Portland, San Francisco and Los Angeles to Manchester, Glasgow, Liverpool, London, Havre, Hull and other ports as inducements offer.
See page 18)

GENERAL STEAMSHIP CORP.

Colman Building. Phone Elliott 5706.
SAILINGS—From Pacific Coast ports to London, Hull, Leith, also Scandinavian and Irish ports as inducements offer.

HARRISON DIRECT LINE

Balfour, Guthrie & Company.
Stuart Building. Phone Elliott 1464.
FREIGHT ONLY.
SAILINGS—Every 30 days from Vancouver, Victoria, Seattle, San Francisco and Los Angeles to United Kingdom. From August to December, sailings every 2 weeks.

ISTHMIAN STEAMSHIP LINES

Norton, Lilly & Company.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.
SAILINGS—Pacific-United Kingdom Service. Every 3 weeks from Vancouver, Seattle, Portland, San Francisco, Los Angeles and San Diego to London, Liverpool, Manchester, Glasgow, Avonmouth and other United Kingdom ports as inducements offer.
See page 14)

JOHNSON LINE

W. R. Grace & Company.
Hoge Building. Phone Elliott 5412.
PASSENGERS AND FREIGHT.
SAILINGS—Monthly between Pacific Coast ports and Bergen, Christiania, Gothenburg, Malmo, Copenhagen, Stockholm and Helsingfors.

NORTH PACIFIC COAST LINE

(Joint Service of the Royal Mail Steam Packet Company and Holland America Line.)
204-206 Rainier Building. Phone Elliott 4944.
PASSENGERS AND FREIGHT.
SAILINGS—Every 4 weeks between Vancouver, Puget Sound, Columbia River, San Francisco, Los Angeles, Liverpool, London, Rotterdam, Antwerp and Hamburg.
See page 18)

SOCIETE GENERALE DE TRANSPORT MARITIMES A VAPEUR

Norton, Lilly & Company, general agents.
Alaska Building. Phone Elliott 2450.
FREIGHT ONLY.

BARGE LINE

The United States Shipping Board recently authorized the transfer of four concrete tankers to the War Department for operation by the Federal Barge Line on the Mississippi and Warrior rivers.

REJOINS BUHR

Glenn D. Evans, for many years connected with the J. F. Buhr Machine Tool Company, has again joined the Buhr organization in the capacity of chief engineer. Evans has been chief engineer of the Climax Engineering Company of Los Angeles for the past three years.

I. M. M. HEAD

P. A. S. Franklin, president of the International Mercantile Marine Company, has been elected a director of the Northern Insurance Company of New York.

SCHOONER SALE

The schooner Carolyn Frances, which has been operating between San Francisco and Monterey, has been sold to M. J. Friedman for $50,000, according to a recent report. This vessel was built in 1918 at the Barnes & Tibbitts yard in Alameda for the Western Whaling and Trading Company. The vessel will now be used in Alaskan service.

NOW IN EAST

J. C. Strittmatter, general freight agent of the McCormick Steamship Company, is on the East Coast visiting the important shipping centers. He will return to the line's San Francisco home office in a month. Charles L. Wheeler, vice-president and general manager, announces that Sam Y. Knight has been promoted to the post of district manager at Los Angeles. Previously Mr. Knight served the McCormick interests as Los Angeles general agent.

FLEET MANAGER

H. I. Cone has been named vice-president and general manager of the Emergency Fleet Corporation, it is announced by President Palmer at Washington. Creation of this new office is understood to effect a more centralized control of the duties connected with the operation of the government fleet with the idea of modeling that organization as far as possible along the lines of a business concern.

HAWAII

Home of the Surf Rider

"From one end of the world to another the fame of Hawaii's surf riders has gone abroad," writes L. W. de Vis-Norton in "Japan" Magazine. "It is certain that in no other place in the world has the art of surf riding been brought to such perfection or carried out with such ease and grace as in the Hawaiian Islands, those lovely mid-Pacific isles, so richly favored of God and man. . . .

"Day by day the long emerald and purple combers cream in over the coral reefs which hem the shallows near the beach and give safety to the bathers; day by day the graceful figures of the natives and white riders are seen erect upon their surfboards, riding steadily and swiftly towards the golden strand upon which the rollers spend themselves in showers of snowy foam."

See HAWAII *this* winter! Matson Line inclusive (all-expense) 21 day tours to Hawaii, with eight days in the islands, cost from $267 to $381, each person. Hawaii is the year-round playground of the Pacific.

MATSON

Navigation Company
225 Market Street, San Francisco

(MAIL THIS COUPON TODAY)

Send me your booklets "Delightful Days on Matson Ships", and "See All of Hawaii", describing Matson voyages and inclusive (all-expense) tours in the Islands.

Name . . . . . .

Address . . . . . .

The Standard of Coastwise Service
YALE and HARVARD
of course!

Between San Francisco LOS ANGELES and San Diego

SPECIAL arrangements have been made for your comfort and entertainment on these luxurious liners.

FOUR SAILINGS WEEKLY BETWEEN LOS ANGELES AND SAN FRANCISCO

THREE SAILINGS WEEKLY TO AND FROM SAN DIEGO

All-Inclusive Fares

Low one-way and round-trip fares: between San Francisco and Los Angeles include meals and berth; between Los Angeles and San Diego include one meal each way.

LOS ANGELES-HONOLULU SERVICE
And also to Hilo

Fortnightly sailings via

"Great Circle Route of Sunshine"

DEPENDABLE FREIGHT SERVICE

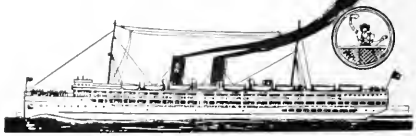
For automobiles and general merchandise direct between Los Angeles and Honolulu.

For Particulars on Both Services Address:

LOS ANGELES STEAMSHIP CO.

For Passenger Information Address:
517 S. Spring St., Los Angeles
685 Market St., San Francisco

For Freight Information Address:
304 Central Bldg., Los Angeles
Pier 7, San Francisco



OYYACETYLENE CUTTING APPARATUS FOR EMERGENCY USE

EARLY in July, newspapers in the East gave a considerable amount of space to a collision in Long Island Sound between the passenger steamer Boston and an oil tank steamer, which resulted in the loss of life of several persons on the former vessel. The victims of this accident were crushed in the steel wreckage of their staterooms.

Commenting editorially on this accident, the New York World in its issue of Monday, July 28, has the following to say:

"Examination of the wreckage was impossible until the vessel had been towed to port. If scores had been trapped behind steel bulkheads and had been drowned or burned while rescuers watched, helpless for lack of cutting tools, the demand that such emergency apparatus be carried on all ships would have been instant. Why not heed the lesson as emphasized by the loss of four lives? Why wait until forty or four hundred lives are lost?

"Scientific use of steel bulkheads was supposed to have made passenger ships practically unsinkable. The loss of the Titantic was an unanswerable warning. But does not the Boston accident prove the need for the oxyacetylene cutting apparatus?"

The necessity for carrying tools and equipment for use in emergencies on vessels as well as on railroad trains has always been recognized. In the days of wooden boats and wooden coaches regulations prescribed that axes, saws, and sledges be carried where they could be quickly reached in time of stress. Now that most passenger vessels as well as up-to-date railroad equipment are steel, these tools, while they are still carried in most instances, are relatively useless in cases of accident.

An emergency always requires prompt action. To make any headway against steel plate and other types of steel construction with an ax or sledge is difficult, if not altogether impossible. But the development of oxyacetylene cutting offers to ship owners and operators and railway officials a solution of this emergency problem. An oxyacetylene unit, consisting of a cutting blowpipe, the necessary regulators, and a cylinder each of oxygen and acetylene, would take up very little room on board any fair sized passenger vessel. Mounted on a hand truck this unit is readily portable and can be quickly moved wherever it is required. The blowpipe itself weighs but a few ounces and, fitted to long lengths of hose, it can be operated wherever a man can reach, and in any position. It will cut through in a few seconds the heaviest steel members found in the construction of vessels.

Oxyacetylene cutting equipment is very easy to operate. It does not require any particular training and in a few minutes any number of the vessel's crew could be instructed in its adjustment and use. Such apparatus could, of course, be installed under the supervision of a machinist, a boilermaker, the chief mechanic, or even the chief engineer. These men would no doubt require little instruction to enable them to operate the blowpipe successfully and to instruct the men under them in its handling.

This is a matter that well merits the attention of ship operators and owners. As the editorial writer in the World states, if a number of people had been trapped behind steel members in this recent accident, the demands that ships carry such equipment for emergency use would have been instant. A wise operating man will not delay the adoption of modern appliances until a shocking disaster brings the necessity to his attention, but will immediately see the advantage of preparing against more serious accidents.

The Wager Bridge Wall

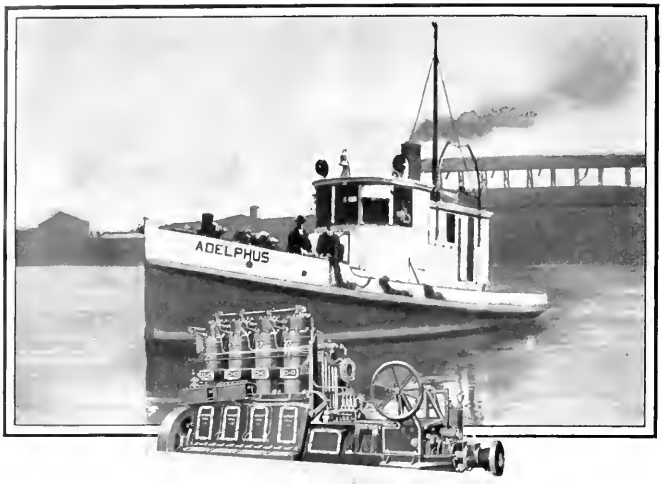
COAL is still used as fuel by the majority of the world's steamships, and any improvement which can be made in furnaces burning coal has a very great effect on the fuel bill of marine transportation.

This is very well illustrated by the results of improvements recently made in the coal burning furnaces of the steamer America operated by the United States Lines between New York and Bremen for the United States Shipping Board. The steamer America was selected by the Fuel Conservation Committee of the United States Shipping Board for a demonstration, largely because she is the second largest coal burning ship in the trans-Atlantic trade.

The committee had but seven days to make the changes in the furnaces, and, as the vessel has 8 double ended Scotch boilers with 48 Morrison corrugated furnaces, it was necessary to move rapidly. It was determined to remove the brick bridge walls and division plates and install in their places Wager patented bridge walls. These walls, as will be seen from the sectional drawing in the illustration herewith, are composed of cast iron, so formed as to be self-ventilating and are much more efficient than brick walls, at the same time occupying very much less space and permitting air to enter at the rear of the fires and so supply the necessary oxygen at the right point to complete the combustion of the gases in the furnace, thereby increasing the heat value of the fuel consumed, so far as useful work is concerned, and also eliminating the smoke nuisance which is so common to coal fired boilers.

These ventilated cast iron bridge walls by reason of this air admission factor minimize the formation of heavy clinkers on the bridge wall, a difficulty which is often met with in the case of brick bridges and which rapidly diminishes the effective grate area of the furnace.

The round voyage subsequent to these changes showed a saving of approximately 500 tons of coal over the average of previous voyages. Thinking that this result might possibly have been from additional care on the part of the engine room crew, the committee watched carefully the second voyage, and found practically the same result. The total expense of the changes made in the furnaces was less than $8000, so that the installation saved more than enough to pay for itself on two round voyages only, and as the experience with Wager patented bridge walls in steam furnaces has been that they are maintained with much less expense than with the brick walls, it would seem logical that this apparatus could be profitably employed in all coal burning furnaces.



Proved best for workboat use —
2-cycle "C-O" Oil Engine

Wherever workboats run, you will find 2-cycle "C-O" engines at work on the hardest jobs.

The sturdy "C-O" does give super-dependability, year in and year out. The simple 2-cycle design is free from cams, valves, push rods, rocker arms and other trouble-making mechanism.

You have reliable power when you need it—to bring a cargo straight through for top market price—to get under way without loss of time or stand-by charges—to power your boat through fair weather and foul.

Use is the most convincing evidence of quality. Today, the trend of the trade is to 2-cycle design — pioneered by Fairbanks-Morse — PROVED best through more than a decade's use.

Fairbanks-Morse equipment can be serviced in all principal ports of call. Our engineers will be glad to give you full information.

FAIRBANKS, MORSE & CO.
Manufacturers **Chicago**

28 branches throughout the United States, each with a service station

FAIRBANKS-MORSE
Type "C-O" Oil Engines

797

BOOK REVIEWS

The Ship and Her Work, by Sir Westcott Abell, K. B. E., 114 pages, illustrated with one duotone frontispiece and 11 plates and diagrams and 4 tables; published by Gee & Co., London; distributed in the United States by The Ronald Press Company, New York. Price $2.25 post paid.

This book, which is volume No. 2 of a series entitled "Studies in Commerce," contains a series of lectures delivered at the London School of Economics during the summer term of 1922 to students who were specializing in the study of shipping questions as part of the course prescribed for the degree of Bachelor of Commerce of the University of London.

The book makes no pretense at going into technical details, but tells in terse and easily understood language the "more important physical principles which must be considered in the construction and operation of the ship as the means by which international sea trade is made possible and the welfare of humanity advanced."

We shall have occasion to quote from this book quite frequently, but in consideration of the present issue of Pacific Marine Review being devoted to a form of diesel propulsion, we will quote here, from the final chapter of the book, the very much condensed consideration of the diesel engine, which shows very clearly the method employed by the author in treating his various subheads, and also explains why it is that our British cousins always can compare the diesel motorship with a coal-burning vessel.

"It is obvious that if it were possible to obtain a more efficient fuel than coal, i. e., a more condensed form of energy, a considerable saving in transport could be effected, provided such new fuel were produced at sufficiently low cost. In an ordinary marine engine plant of Scotch boilers and triple-expansion engines, the consumption of coal is somewhere about 2 lbs. per horsepower per hour, including therein the power required to drive the necessary auxiliary engines. In the diesel engines, using heavy oil fuel of suitable variety, it has been possible to develop power for $\frac{1}{2}$ lb. of fuel per horsepower per hour, a saving of at least $1\frac{1}{2}$ lbs. per horsepower per hour, which is a considerable amount.

"In a modern diesel engine-fitted ship there is a saving of total space occupied by the machinery alone of about $7\frac{1}{2}$ per cent, while the weight of machinery is about the same in the working condition. On the other hand, there is an increase in deadweight equal to the fuel saved, that is to say, whereas in an ordinary 8000 ton tramp steamer the coal-fired boiler would use, say, 50 tons of coal per day, the diesel would only use 12 tons of fuel a day, and for every day run of the voyage 38 tons more cargo could be carried, so assuming a 16 days' voyage, there would be a saving of 640 tons in fuel, which could be used for increase in the deadweight capacity of the vessel.

"It should also be mentioned in connection with the economic side of the question that the initial cost of the diesel engine is considerably in excess of that of the corresponding steam machinery. It may, however be taken broadly that where the cost of oil per ton for diesel engine purposes is not more than four or four and a half times that of the cost of bunker coal per ton, the advantage is always with the diesel-engined ship.

"It is also fairly evident from a study of the economics of various types of machinery, although opinions on this subject vary considerably, that there are only two alternatives which can be considered, viz., the ordinary marine plant burning coal, and the diesel engine. In comparison with these two methods, and excepting large passenger vessels of high speed, it is uneconomical to burn oil instead of coal under boilers either with the ordinary reciprocating engine or with a refinement of that process where oil is burned under water-tube boilers and steam is used with turbine geared machinery. It is not proposed to attempt to give a description of the operation of the diesel engine because the fundamental principles are very similar in operation to motorcar machinery, with which most people now-a-days are more or less familiar. There are certain difficulties, however, in regard to the operation of the auxiliary machinery which is necessary for a modern vessel, and these are obviated in various ways by driving the auxiliary machinery by electrical power produced by a separate oil engine, or sometimes by fitting an auxiliary steam boiler fired by oil. Of the two alternatives the electric drive seems to be preferable although it requires a greater amount of supervision on the part of the engineers in charge."

Department of Commerce Year Book, second issue, prepared under supervision of Secretary of Commerce Hoover.

"The Commerce Year Book is published to meet the need not merely for a reference source to be consulted for specific facts on the recent past of business, but for a book which can be read for general commercial information and as a survey of the most important economic developments of the year," says Dr. Julius Klein, director of the Bureau of Foreign and Domestic Commerce, in a foreword. "It is thought that the facts contained in this issue and its successors will be of assistance in laying out long-range programs for the stabilization of business and industry so as to minimize the economic losses resulting from the recurrent extremes of the business cycle.

"The usefulness of a periodical of this character depends, in a large measure, upon the completeness of its data and upon its prompt publication. Much basic information, however, is not available in final form until the second quarter following the calendar year under review. In order to effect the broadest service possible, it has been thought preferable to withhold the issuance of the Year Book until these final data could be included."

Charles Proteus Steinmetz. 489 pages, 18 illustrations, frontispiece, and a forword by J. Le Roy Hayden; attractively bound. Published by The Century Company, New York. Price $4.

It is the story of a great man and of a great career; not merely the history of renowned engineer, but of an eminently gentle and lovable personality.

Moreover, it is the correct story. Despite the fact that Dr. Steinmetz was in the public eye more than almost any other of his calling, probably more popular myths surrounded him than any of his noted contemporaries.

The author, John W. Hammond, wrote from the standpoint of one who knew both Dr. Steinmetz and his friends and fellow workers. Several of the chapters were finished before the great engineer's death and were subject to his review and approval; the remainder of the book was completed with the cooperation of the latter's foster son, J. Le Roy Hayden, with whom Dr. Steinmetz lived.

FERROMANGANESE IMPORTS

THE largest single shipment of standard ferromanganese, 78-82 per cent, received on the Pacific Coast recently arrived in the Danish motorship Chile.

This shipment was received by the Electro-Metallurgical Sales Corporation, who have just recently established a Pacific Coast sales office in the Balfour building, San Francisco, and have established warehouses at Los Angeles, San Francisco, and Seattle. This ferromanganese is the initial shipment for stocking these warehouses and will be followed by other shiyments.

The Electro-Metallurgical Sales Corporation, with main office in New York City and plants located at Niagara Falls and other points in the United States, as well as in Norway, are the largest producers of ferro-alloys in the world. They also propose to carry stocks of other ferro-alloys at their Pacific Coast warehouses, depending upon the demand for such other ferro-alloys in this territory.

It has heretofore been necessary for the larger consumers of ferromanganese to protect themselves by carrying large stocks of this material on hand at all times, but the establishment of these warehouses, which now gives them a dependable source of supply for prompt delivery, will make unnecessary the maintenance of large stocks by individual companies.

"POSTAGE STAMP AGENCIES" IN ORIENT YIELD SCANT RETURNS

AN American manufacturer who attempts to secure an agent by correspondence alone in a highly competitive Oriental market, such as Japan, is inviting disaster, according to Paul P. Steintorf in Commerce Reports. Peculiar trade conditions, language difficulties, tremendous distance and consequent delay in communications, inadequate credit information, lack of knowledge of competing lines, lack of personal familiarity with the field, and of personal contact between manufacturer and agent, all combine to prevent the American manufacturer from securing proper representation.

He may inadvertently give his line to a company that already handles several competing products or one that has taken on more agencies than it can handle. His agent may be excellent in certain lines but poorly equipped to handle his particular product, or may be fully able to cover a portion of the field but unable to secure proper distribution for the rest of the country. The manufacturer can never be sure that he has obtained the best possible distribution by these methods. In fact, "postage stamp agencies" are apt to be worth little more than what they cost.

If you wish to place an agency for Japan, first canvass all the large general trading companies that maintain offices in this country. These companies are fully equipped to cover the Japanese market, provided they are not already handling competing lines. If they are not interested, then send a fully qualified representative to Japan to place the agency. Give him authority to settle all questions that may arise. See that he has full power of attorney and has all necessary credentials to establish fully his position and authority.

Do not place any unnecessary restrictions on expense or the duration of his stay. Remember that business moves slowly in the Orient and that haste is viewed with suspicion. Six weeks is none too long to complete all details. Personal contact and the social amenities are of paramount importance.